

THE RELATIONSHIP OF MANAGEMENT DECISION MAKING TO SMALL BUSINESS GROWTH

Prepared by the
COLORADO STATE UNIVERSITY RESEARCH FOUNDATION
COLORADO STATE UNIVERSITY

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TO SMALL BUSINESS GROWTH

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COLORADO STATE UNIVERSITY RESEARCH FOUNDATION
under a Small Business Administration grant awarded to
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by
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and
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FOREWORD

This Small Business study, The Relationship of Management Decision Making to Small Business Growth, has been conducted and prepared by Colorado State University under the direction of Professors F. Parker Fowler, Jr. and E. W. Sandberg.

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Only a limited number of copies of this report have been printed. It is available for reference in any of the Small Business Administration offices throughout the United States or at many reference libraries. Copies of the report also may be purchased for \$4.00 directly from Colorado State University Research Foundation, Colorado State University, Fort Collins, Colorado, 80521.

Summaries of this study have been printed and are available in reasonable quantities. These summaries may be secured from SBA field offices or from the Small Business Administration, Washington, D. C. 20416.

The Small Business Administration assumes no responsibility for the accuracy of the data contained herein, nor does it necessarily endorse any opinions, conclusions or recommendations which may be a part of this report.

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Chapter I

INTRODUCTION

The viability and growth of a business firm results from management expertise in decision making, even though survival and growth may be only implicit goals of the firm. Thus a study of factors of growth and viability must be in essence a study of the way in which businessmen make decisions relative to the attainment of these goals. The academic analogies drawn between businesses and biological organisms (conception, growth, stagnation, decay) consider the business firm as a thing with life, but no internal will; its viability and growth are products of evolutionary forces created by an economic environment over which the entrepreneur presumably has little control.

As a description in the large of the fate of business units, these analogies are defensible; yet they do not indicate where one is to seek a solution to the viability, or stability, problem faced by any business. To recognize, however, that the selection of any alternative will bear upon both the viability of the business and upon its eventual growth, is to throw the problem into the realm of managerial practice and competence, i. e., decision making.

Although the failure of certain businesses can be traced to random tragedies which appear to be separable from the usual course of business, some businesses will succumb to these tragedies where others will not, even within the same industry. This leads to the conclusion that, other things being equal, some decision makers place viability high enough in their priority structure of goals that adversity cannot force their failure.

On the other hand, conscious decisions relative to viability must be anti-thetical to overt growth decisions which require the undertaking of alternatives involving the risk of firm failure. While the attainment of viability as a goal requires the conscious minimization of such risks, growth dictates that capital be ventured in the selection of alternatives that are necessarily riskier in terms of ultimate payoffs. Witness the small sub-contractor for government defense contracts who is unwilling to expand his plant to handle current volume in anticipation of possible cancellation of contract. Witness also those who have elected to expand. We never know what might have been realized by the viability maximizer; we do know what happens to the growth maximizer: he becomes successful in the undertaking, fostering new growth, or he succumbs in failure.

Basic to any business decision are two real requirements placed upon any decision maker:

1. He must recognize the constraints which restrict his actions, and he must know what alternatives are available to him. That is, he must be able to distinguish between those things which he can control and those which are beyond his control. (We shall point out later the importance of this distinction, for it sheds some light on a possible distinction between small and large businessmen.)

2. He must be able to "predict" the result of any decision in terms of its effectiveness in attaining the goals which he has established. Some management practices have payoffs which are predictable with certainty: careless control of funds, disregard for customer service, etc. On the other hand, the result of most "positive" management practices can only be predicted within some range of probable occurrence, this range usually established subjectively by the hunch or intuition of the decision maker.

The extent to which any decision maker is able to solve or resolve the problems

posed by the two requirements above is a measure of the "completeness" of his information.

In practice, it is likely that the manager will make decisions within a framework of incomplete information, especially in the knowledge of those things which he can control and those which he cannot. Since the smaller businessman cannot afford the specific and voluminous information available to the large corporation, much less the time to specialize his decision making in any one area; it might be expected that the smaller the operation managed, the fewer the alternatives which the manager believes available to him, and the more likely he is to select an alternative based on historical precedent or intuitive evaluation.

Thus a study which compares the performance of businessmen, i. e., the results of their decisions, against their expressed purposes, should divulge two things:

1. How well they succeed in realizing goals which they have explicitly set for themselves, and

2. How well they understand their own state of information.

The latter result deals with the level of understanding of the businessman of where he is going and whether or not he knows how to get there, regardless of any "proper" way to reach his goals which might be used by others.

A real problem arises in distinguishing means from ends especially for the small business in which the goal setter is also the alternative chooser. For most managers in the large business, if not for all, the highest order goals are usually well-defined, if poorly understood; even the small decentralized, profit-centered unit, management deals with means to given ends. In the small business, however, it is almost too easy for management to explain its failure to reach "proper" goals

in terms of other goals or ends which more closely agree with their expert evaluation of the business' performance.

Thus a study of the factors which affect growth and viability of the small business in terms of the way in which the small businessman approaches his goal-setting and alternative-choosing problems should be valuable in directing the course of assistance to such people. For if assistance is given in areas which do not jibe with the small businessman's distinction between means and ends, or which do not fit his concept of the existing state of information, then such assistance will perhaps be of little use. Indeed, the small businessman might be distinguished by the fact that he is required to set goals as well as choose operating alternatives to attain them within the constraints of limited information. Perhaps such a definition provides insight into the type of assistance most needed by the small businessman: assistance in decision making itself.

Chapter II

THE STUDY PLAN

The goals of this study can be explained as a test of the following hypotheses:

1. There exist certain fundamental decision making characteristics which determine the stability and growth potential for any firm; there also exist irrelevant characteristics which may be ignored in such a determination.

2. There exist norms in terms of the relevant characteristics by which the viability of the small business firm relative to other firms in the same industry can be determined.

The study proposes to test the above hypotheses to determine their validity as a basis for a theory of small business. Should the analysis not reject these hypotheses, then it is possible to postulate the kinds of assistance which will be truly helpful to such businesses. On the other hand, should the hypotheses be rejected, then two conclusions may be drawn:

1. The analytical method was insufficient to properly discriminate among the characteristics and their causes, or

2. Such characteristics cannot be generalized for all small businesses, with the result that recommendations for assistance must be made on an individual firm basis.

Methodology

In order to test these ideas it was necessary to devise a universe of sufficient homogeneity that comparisons among business units could be made without excessive interference from differences in production techniques, or wide variations

in the management of product marketing. The universe selected for this study satisfied these criteria:

1. The technology within the industry studied is well understood and common production practices are generally found among the individual business units.⁽¹⁾
2. The product itself is perfectly homogeneous among business units.
3. All marketing is handled through wholesale arrangements or through retail firms which do not discriminate among the production units.

Since the price received by the production units and the quantity of goods sold is not dependent upon the merchandising efforts of the firm manager, it is then possible to discard marketing as an element of management expertise in comparing the operations of the firms studied. Although aggressive merchandising tactics are certainly necessary to the survival of most small business units, it is felt that its exclusion from consideration in this study results in a purification of the universe involved, by reducing the number of variables to be considered in a manner which enhances rather than detracts from the validity of the analysis.

For reasons which will be discussed in the next section, the methodology of analysis takes three forms. The first phase of the analysis is a description of operating results of individual firms in the industry through time-series analysis of a six year period (Chapter IV). Six measures of performance were prepared for this

¹Note: The industry used in this study will not be specified, because such information would make possible the identification of individual firms included in the survey. This is in accordance with the assurance of anonymity given to all firms participating in this project. The industry studied is an important part of the economy of the State of Colorado, and is a leading competitor in national markets. While care must be exercised in generalizing from data developed from one industry, it is felt that the decision making behavior patterns analyzed in this study are indicative of observable patterns in many small businesses.

analysis on the basis of their availability and meaningfulness to the test of the hypotheses. In the absence of standardized cost data it became necessary to develop measures of performance other than those usually used, i. e., other than profit. The analysis of these data is useful in demonstrating the diversity of performance within the industry in relationship to the absolute size of the individual units, as well as in terms of those areas of performance where size alone is not the distinguishing characteristic.

The second phase of the analysis (Chapter V) was derived from depth interviews of a sample of business units, culminating in a set of stereotypes which demonstrate the diversity of goals and decision making expertise found among the firms in the industry, especially with reference to the confusion of means and ends. This phase was especially important in establishing the kinds of questions which should be asked and could be answered in the survey work required in phase three. In effect, the insights gained into current managerial practice within the industry as spelled out in the stereotypes provided a basis for the postulates used in the analysis of phase three.

Since the general opinions and judgment of the individual managements have a controlling effect upon the relative performance of any unit, we examine in the third phase the attitudes reported in a survey of all firms in the industry (Chapter VI). This survey of individual units provided the means for categorizing performance characteristics by groups. The general purpose of this section of the study was to determine whether or not the goals explicitly expressed by each firm had in fact been realized, or had been dominated by implicit goals. A further purpose of this section of the study was to determine the latitude which the individual manager perceived to be available to him in his decision making.

Chapter III

STRUCTURE OF THE INDUSTRY

Introduction

Since this is a study of an entire industry of small business units, it seems important that the characteristics of the industry be understood. In this chapter, then, is discussed the structure of the industry with reference to the market and marketing practice, production technology, and size and organization of individual firms. The analysis to follow in subsequent chapters depends upon the comparability of the firms; the extent to which the firms are homogeneous with respect to the criteria above becomes very important in the significance of the analysis.

Distribution and Merchandising

The Colorado industry studied consists of some 150 firms; 90 percent of these market their output through an exclusive marketing contract. In Denver there are three main wholesale houses which handle the bulk of total industry production. One of these houses is independently owned; another is a cooperative venture; and the third is owned, through stock, by the producers marketing their output through it. Although prices fluctuate seasonally, the price paid to the producer is not significantly different across the wholesale houses, net of various services provided by the wholesaler.

Except for quality differentials, the product itself is perfectly homogeneous across all producers. Differences in average return per unit produced in any "pool" period are accounted for by price differentials established for the four quality grades into which any day's production will be classified. (A "pool" is an arbitrary period of time in which the sales of the wholesale house, at going market prices, are lumped

and distributed pro rata to the producers, on the basis of production and quality. Seasonal influences can affect fluctuations in the price received by the producer of as much as 100 percent for the highest quality unit.) Thus, a firm committed to and realizing a policy of high quality of output will enjoy a higher unit revenue than the firm producing primarily units of standard, or lower, quality.

The industry supports an active trade association. Practically all of the consumer and/or institutional advertising is handled through the trade association, and supported by a stipulated percentage of gross revenues deducted from the producer's receipts and paid by the wholesale house to the association. A research committee made up of producers within the association maintains a continuing program of inquiry into product improvement, technological innovation, and economic development of markets and marketing practices. The budget of the research committee is included in the budget of the association, and sustained by contributions of the producers computed on the basis of gross revenue.

The product is marketed nationally at the present time, although some attention has been given to the feasibility of international market penetration. Since the product is perishable, transportation into the eastern and western markets of the United States is critical; the product is shipped by air freight or air express. Shipping technology has been refined to a high degree to maintain quality as a result of the activity of the association research committee in consultation with the State University.

Competition among firms in the industry is restricted to those areas of decision-making which either bear on net profit (primarily through individual control of process) or on more intangible goals having to do with pride in quality of production, condition of plant, adoption of new technology, etc., because the individual firm is a price-taker with no control in the market. Competition in the

national market, however, is becoming of greater concern to the Colorado industry, primarily that competition which is developing as the result of improvements in industrial technology in California, both in process and industrial organization. Because of lower process costs in California, the California industry can compete on price in eastern markets with the Colorado industry in spite of higher transportation charges. With reduction of international air freight rates and improvements in the speed of service, the domestic industry also faces possible competition from foreign suppliers as well.

Except for setbacks which occur more as the result of natural weather phenomena than from economic disturbances, the industry is growing in all respects, especially total production at approximately 15 percent per year. Within the last eight years there have been a few terminations of individual firms, none of which have been classified as business failures. Increases in total industry production have been realized through expansion of existing plants and intensification of process control, rather than by entry, which is barred only by a relatively high plant investment requirement and technological knowledge.

A large portion of the demand for the product is derived from institutional users who require high quality; the consumer demand is realized from that part of the consuming public willing to pay a relatively high price for perishable products. Since this product can be produced by the consumer himself as the result of leisure time activities, as leisure increases in this sector of the economy, the demand for the product created in this sector may deteriorate, creating another competitive force.

Technology

Although the basic production process is not new in any sense, both process and product have been refined within the past few years to a level which dictates

that the firm manager know in much greater detail than before the technology of his production process. The trade association has been of primary importance in providing communication in this important area, and all firms are aware of technological changes whether or not they are willing to experiment with them.

The seasonality of market demand, for instance, is such that the producer should schedule production to maximize his output during the peak periods. His problem is to determine the proper time for setting up to produce for a given market period, as well as to decide upon the resources to commit to the production of this batch. Although setting up is expensive and time consuming, the process dictates that a new set-up is required sooner or later, i.e., without a new set-up, the process will degenerate to the point where it no longer produces a marketable output.

Traditionally, set-up time has been signalled by the end of the production "year", which occurs in the early summer. Current research and thought is directed to the determination of less arbitrary decision intervals, the purpose being to reduce set-up cost over time, and thus to reduce total cost, by integrating the requirements of the market with the constraints of the process. Reaction to this concept among the firm managers is mixed; the younger managers of less experience but usually with better education tend to support the new technological concept, while the older, more experienced managers are, with exceptions, somewhat skeptical. (This difference will be discussed at greater length in the analysis of Chapter VI.)

A wide spectrum of physical plant facilities is found in the industry. Some plants are fifty years old, while newer facilities exist in which process innovations have been "built-in", rather than added on. Quite obvious is the aggressiveness with which some managers adopt or adapt new ideas on an experimental basis, while others will wait until the innovation is proved in actual operations to be worth its cost.

Technological assistance in production control is provided to the producer on a fee basis by the wholesale house with which he is associated. Since the quality of the product is important to the wholesaler, it is imperative that each firm maintain its process within a range of control which will not compromise the quality of the product which the wholesaler ultimately must make available to the market.

A problem which continues to face the industry is the establishment of grading standards which can be understood and followed by the individual firms. Although the individual firm inspects and grades its own production into sales batches of 25 units, the wholesale house may downgrade any batch in which any unit is substandard. The problem arises because within grades there are rather wide fluctuations in quality, determined by a number of criteria. A unit may be top grade with respect to most of the criteria, but fail in another; presumably such units ought to be downgraded, although this is often not the case. On the other hand, there are some firms which prize quality highest among their operating goals; such firms adhere to such rigid quality standards that their self-graded No. 2 product will often be better than another firm's No. 1 graded product when the latter is acceptable in that grade to the wholesaler.

In the face of the mounting competition mentioned previously, it appears necessary that the industry be able to differentiate its product on a quality basis from that of competitors. Such differentiation will require continued research and innovation in the production process as well as in merchandising. Some suggestions a propos of this requirement will be offered in the conclusions of this study.

Firm Organization and Size

There is no question that the firms in the industry studied are small, by any standard. By far the greater proportion of firms employ five or fewer people; the largest firm for which data were available employed only 26 people, while four

firms reported no employees other than the owner-operator. The exact number of employees is difficult to ascertain, for a number of reasons: (1) the seasonal nature of the business causes fluctuations in employment; (2) many firms are family owned and operated, and family members may not be considered as employees of the firm; and (3) part-time help, often students, is widely used, thus distorting the relationship between the actual scale of an operation and the number of people employed.

Productivity indices on individual employees are not developed by the firms, although managers are subjectively aware of individual differences among employees. Where few people are employed, they are more likely to be salaried than hourly paid, and such people are trusted to keep things going in the absence of the manager. Although labor cost is the largest operating expense item, refined unit costs of labor are neither computed nor charged to the process within which they arise; thus it is not only impossible to derive any meaningful measures of performance in terms of labor cost, but also, labor force decisions are made on an ad hoc basis as would be expected.

Since the firms are small and have their family-like character, it is not surprising to find them lacking any kind of explicit management or organizational structure. Many firms depend upon an outside accountant, and perhaps an attorney, for managerial advice when confronted with decisions concerning cost control, plant expansion, and so forth. Technical advice is obtained from the field consultant provided by the wholesale house, or through informal conversations with other managers when making deliveries to the wholesale house.

As mentioned previously, grading of output presents some serious difficulties, and perhaps the individual producer is most sensitive to this area of decision since errors can result in a loss of as much as 40 percent in total revenue on any batch. It is surprising that in so many firms the decisions required in this operation are

left to others, especially when these people are found to be hourly-paid, and in some cases, even part-time help.

Further insights into the organization of these firms are given in Chapter V where the various stereotypes are discussed with respect to decisions made or avoided.

Chapter IV

PERFORMANCE MEASURES

Data Availability

Since we are told in economics that the rational business decision maker seeks to maximize profits as an overriding goal of his enterprise, one would like to include net profit in a set of measures of performance within any industry. But other researchers in small business phenomena have experienced the same difficulty which arose in this study: net profit is determined by the difference between two other performance measures, total revenue and total cost. In order that comparisons between and among individual business firms have any significance, the firms involved must report revenue and cost data in the same fashion, i. e., the numbers must be derived in the same way in every instance. Although revenue figures are homogeneous and comparable within this industry, the same is not true for cost data. It is not uncommon for some firms to keep their business and household funds in the same checking account, and for labor expenses in the business to be charged in the same way as household groceries.

An important expense item to any firm is the cost of management. Another common practice in the industry (as in small business generally) is failure to charge a proper amount against the business for management; for the firm organized as a sole proprietorship, this requirement seems to be a lot of unnecessary bookkeeping, since by definition any net proceeds go to the owner no matter how they are accounted for. On the other hand, there are enough firms which properly account for expense items that it is impossible to generalize about the meaning of any total cost figure

without analyzing and adjusting for discrepancies or deviations from an accepted norm. (See conclusions and recommendations, Chapter VII.)

The mishmash of cost accounting practices common to this industry was not unexpected, however, since most small business suffers from the ailment. Indeed, the industry here studied was chosen primarily because it was deemed possible to measure performance on the basis of other criteria which did have homogeneous characteristics. The measures of performance discussed below are submitted as these useful and relevant criteria.

Study Criteria

Through the industry trade association, the wholesale houses whose firms are included in the study agreed to maintain yearly data for each firm on unit production, dollar return per square foot of plant, and units produced per square foot of plant. From these measures, three other criteria were computed in order to normalize measures in specific terms: absolute plant area in production, dollar return per unit, and total dollar revenue. It should be noted that whether or not these criteria are reasonable, the industry generally recognizes them to be valid, ranking individual firms within each wholesale house by each of the three former measures. Since this study is directed toward the analysis of goal attainment, these criteria become controlling when perceived by the firms as measures of worthwhile goals. (The degree of such perception is analyzed in Chapter VI.)

In order to test the hypotheses pertaining to growth, data were collected or generated for each of the six measures over a six year period, this period being the maximum length of time into the past within which comparable data were available. For each firm two types of growth parameters were computed for each of the six criteria: a simple linear fit to the data, and a semi-logarithmic fit in terms of the logarithms of the original data. Output of the simple linear least-squares

computations was the slope \underline{b} of the regression of the data on the years involved, and the standard error of this parameter. The semi-logarithmic computation resulted in the slope $\underline{b \log}$ of the logarithmic series, with its associated standard error. Also computed were actual mean values.

The logarithmic series was used partly because of the great diversity in size, up to 1000 percent, of the firms in the study. Since equal increments of change in the logarithms of the original data reflect equal rates of change, this series permitted the comparison of firms in terms of relative growth, regardless of their size. Thus, two firms having the same value for the $\underline{b \log}$ parameter are growing (or shrinking) at the same rate. The results of these computations are found in Appendix A.

It will be noted that the standard errors of the parameters indicate extremely high variance in the original data. Part of this variance is due to the small number of years involved in fitting the lines to the time series, and the resulting small number of degrees of freedom (five) dictated by conservative statistical practice. However, extreme variance can also be attributed to general weather fluctuations and individual production breakdowns which occur randomly, but regularly, in this industry.

The researchers had originally hoped to isolate by multiple regression those factors of decision making which played a predominant role in the performance of firms. Since the performance measures themselves are subject to such great variance, multiple regression was abandoned as an element of the research design in anticipation of statistically insignificant results. This should not be taken as meaning that the performance criteria are not useful when used in other types of analysis, but only that the mathematics of the multiple regression techniques is too sensitive to the gross values of the residuals which would have been developed here.

Interpretation of Performance Criteria

1. Production Volume. Except for grading by the four quality standards mentioned above, all firms produce the same kind of output. Thus total production provides a comparable measure of activity among all firms. Mean production volume for the six-year period provides a comparable, absolute measure of size of the firm. On the other hand, the absolute growth statistic (b) is of limited use, due to the great disparity in size of the firms studied. More useful is the relative growth statistic ($b \log$) which reveals common rates of change in production volume. The standard error of this statistic can be considered to be a measure of stability, in the sense that smaller variance indicates less fluctuation around the theoretical and stable time path of growth in total production. There are so many factors which enter into the differences in yearly production for any one firm, however, that this construction of the meaning of the variance in the growth statistic must be submitted without proof of its validity. In any event, it was found that the decision categories used in Chapter VI were insensitive to grouping firms by the amount of variance which their performance displayed about either of the theoretical time paths (absolute linear and semi-log linear). In fact, no significant differences were generated by grouping firms according to variance; and only with respect to total production could any pattern be discerned with respect to these performance criteria. Grouping by relative growth rate also produced no significant differences, although some patterns were discernible, which are commented upon in Chapter VI.

2. Return per Square Foot of Plant Space. This criterion is generally accepted in the industry as an important measure of performance, since total output is so closely associated with absolute size. This measure is thus used as an index of both quality and intensity: return per square foot can be increased by producing higher quality units and/or by producing more units per square foot, and in addition, producing more

units during the seasonal price peaks. Higher returns thus indicate greater attention to product and process control, which are associated with "proper" management practice.

This measure is not sensitive to size in the same sense as total production (above); since this measure is a ratio, each firm is on equal footing with respect to product and process control. Absolute growth in this measure is therefore useful, unlike the volume measure. Except in one important case, variance in this measure proved to be disuseful, as well as variance in relative growth. Grouping by mean return per square foot was very useful, and some interesting patterns were generated with the relative measure.

3. Production Volume per Square Foot. To distinguish between decisions relative to revenue generation and those pertaining strictly to intensity of production, this criterion was computed from other known data. It appeared to be important to the study to be able to measure performance in terms of production intensity alone, since production volume is one of the explicit goals of many of the firms. Where a firm is limited by its physical size, its only recourse in increasing production volume is to increase the intensity with which plant space is utilized. As a ratio measure this criterion also provides a usable absolute growth statistic, and in one case, an important variance statistic. Both mean intensity and relative growth in intensity provide useful patterns for analysis.

4. Actual Size (Square Feet of Plant). Although this measure provides the same difficulty of interpretation as absolute production volume in terms of absolute growth, one important observation was generated from the absolute growth in size statistic. Variance was inconclusive, undoubtedly due in this case to the statistical restriction of degrees of freedom (since changes in size do not fluctuate to the extent

of changes in volume, especially downward). Both mean size and relative growth in size generated worthwhile information.

5. Total Revenue. Since total revenue is a function of so many decision variables, it was not expected that this criterion would generate much information of great statistical significance. Although these expectations were realized, more interesting patterns emerged than had been expected. Again, variance in this absolute measure was an inconclusive measure of performance as previously. Since the individual firms are price-takers, it did not seem reasonable to assume that the firms would be other than revenue maximizers, and thus no cross-classification with respect to this goal was included in the survey design.

6. Return per Unit. This ratio is an important performance criterion not only because of a disparity in realized performance of as much as 150 percent among firms, but also because it reflects quality of production as well as timing of output, both of which must be consciously sought as operating goals if high performance in terms of return per unit is to be realized. The second highest number of significant differences between high and low performing groups was generated by this criterion, attesting to its relevance. It should be noted that quality as a goal in itself can be attained in two ways: units can be produced to high quality standards, or the output of the process can be graded by the firm according to its own idea of quality. Thus we have a situation of ex ante planning to attain this goal of high percentage of quality output, or ex post realization in terms of deciding which units meet quality standards, given an output which meets other criteria such as maximum intensity or maximum volume. Although certain important things can be ascertained by grouping according to this criterion, more positive results could have been obtained had data concerning timing of production been available, since seasonal prices themselves vary by as much as 150 percent. Although it is not technologically feasible to produce only

for price peaks, the skill exercised in process control to maximize production during high price periods can explain a great deal of the variance among firms with respect to return per unit.

Chapter V

ADMINISTRATIVE STEREOTYPES

After the operating data had been collected and analyzed, interviews were conducted with the managers of a group of firms to determine the administrative characteristics which appeared (on a subjective basis) to differentiate the relatively successful firms from those which were less successful. The criteria considered in selecting the firms to be interviewed were:

1. Relative growth rate in total revenue,
2. Mean return per square foot of plant space, and
3. Mean return per unit of production.

The firms selected were considered to be typical of those which were significantly above or below average on each of these performance criteria.

Since this phase of the study was designed primarily to provide an information base for the development of the detailed attitude questionnaire to be submitted to all firms in the study, only fifteen firms were included in the interview design. The interviews were unstructured and held in a very informal fashion to encourage the administrators to discuss openly their operation, attitudes, aspirations, business philosophy, complaints, and general observations about their own firms and their industry.

In addition to providing the background data desired for the questionnaire, the interviews revealed a compelling response pattern which seemed to "naturally" group the administrators into three classes, based on operational objectives, decision making rules and techniques, and attitude. A description of the characteristics possessed by the administrators in each of these classes is outlined below.

While this analysis is a generalization based on a very small sample, and represents only a stereotyping of the administrators studied, these vignettes have proved to be a useful and interesting classification system for the firms studied. A word of discretion is in order: although most of the administrators contacted could be placed generally into one of the classes noted below, probably no class would be a "perfect fit" for any particular manager.

STEREOTYPE I: The Conservative Operator Managing the Relatively Stable, Often Small Firm.

A. Operating Objectives:

The major goal of Stereotype I is the survival of his firm. He believes the best way to achieve this objective is to maintain the status quo; therefore, growth in terms of production, revenue, or profit is not an objective. He is quick to recognize the importance of quality to the Colorado industry. He also tends to concentrate on maximizing the quality of his own production, even though he understands and is critical of the tendency of the industry's marketing system to undervalue (in comparison with relative production costs) the highest quality product.

B. Decision Rules and Techniques:

The primary decision rule used by Stereotype I is to follow the established historical decision patterns "which have actually been proved in practice." Operating records are kept in minimal fashion to provide the information necessary to prepare Federal and State tax returns. Such information is not considered important to current operating decisions. (i. e., "I don't think I could do a better job if I knew how much it cost to produce any single unit. I know from experience the way to make money in this business!")

C. Attitude:

Stereotype I is an experienced, seasoned operator, who is concerned about the future of his industry. He believes that cooperation among the firms in the industry could be improved; and that the marketing system of the industry is not efficient as measured against a dollar standard, nor effective as measured against the objectives of the industry (i. e., for his firm).

STEREOTYPE II: The Industry Stalwart.

A. Operating Objectives:

Stereotype II says that his primary goal is to maximize net profit, yet his operations indicate that he in fact seeks an acceptable rather than an optimum level of profit. Although he talks profits, he also seeks acceptance by his peer group (i. e., other managers in the industry) and the maintenance of his firm's status in the industry (e. g., relative size of operations, product quality image, etc.). Stereotype II does not seek to maximize growth, but does attempt to maintain a firm growth pattern which "keeps up" with the industry.

B. Decision Rules and Techniques:

Stereotype II is a great industry supporter; his primary decision rule is to follow current industry practice. He is not an innovator, but is ready to accept technological changes when proved in practice. He is interested in the development of better operating cost information; however, he visualizes the use of cost information in strictly an ex post fashion (i. e., in evaluating past decisions), rather than the ex ante evaluation of alternatives affecting future operations.

C. Attitude:

Stereotype II is the "backbone" of the industry and the nucleus of the industry's trade association. He may be an officer in this organization, but in any case is a strong organization supporter. He views the future with confidence. He believes that his firm, his marketing affiliate, and his industry are strong and doing a fine job. His primary concern for the future involves the possible implications of national competition, but he views the position of the Colorado industry with confidence.

STEREOTYPE III: The Aggressive, Innovating Operator Who Manages A Progressive, Growing Firm.

A. Operating Objectives:

Every activity that Stereotype III engages in affirms his dedication to the goals of maximum firm profit. Although the history of his operations indicates a rapid growth pattern, he views production and revenue growth only as a means to the achievement of his primary goal.

B. Decision Rules and Techniques:

Stereotype III admittedly seeks to maximize production from resources at his disposal, recognizing that the marketing system of his industry does not provide an adequate price differential for superior quality products. He is vitally interested in his operating costs, and believes he could do a much better administrative job if he had adequate cost information. On the other hand, he is not a cost minimizer, but in a practical fashion evaluates alternatives as a margin maximizer (i. e., as an intuitive marginalist).

C. Attitude:

Stereotype III is an aggressive innovator, who takes pride in his reputation as a leader, even though his operations are sometimes criticized by

his industry associates. He retaliates by being critical of the practices of his industry and of the operation of his trade association. (For example: although pushing production in his own plant to optimize his firm's goal attainment, he insists that product quality is not properly rewarded by the industry, and that the Colorado product--which is considered in national markets as a quality product--will maintain its market position if, and only if, it is differentiated from competing products on the basis of quality.) He considers his profession to be a difficult way to make a living. While being surprisingly critical of his own career, he is enthusiastic about his firm's future. Although relatively successful, he is concerned about his administrative problems (e. g., lack of operating controls.)

Chapter VI

ANALYSIS OF GROUP DIFFERENCES

Methodology

Since the high degree of variance in the performance criteria obviated analysis of predominant factors by multiple regression or analysis of variance, it became necessary to devise a new research design which would provide the necessary insight, still within the bounds of conservative statistical practice. That is, the performance criteria represented valuable information which could be used in conjunction with other data, to explain differences among firms and give credence (or fail to support) the general hypotheses outlined in Chapter II.

A series of depth interviews was conducted to determine the nature of decisions which were required of the managements; attention was given to daily operating routine and short-run decisions, as well as to long-range plans. Insights into the goals and perceived alternatives of the managers interviewed provided the basis for a questionnaire (see Appendix A) which was mailed to all of the firms associated with the three participating wholesale houses. Of the 105 questionnaires mailed, 81 were returned, for a response of 77 percent. However, only 76 of the returns were received by the cut-off date (some being returned as late as a month after the cut-off) for an effective response of 72 percent.

A full six years of data were not available for all of the firms originally included, either because some of the firms extant at the date of the study had recently entered the industry, or because a change of management had been experienced within the period which would have obscured the continuity of growth decisions over time.

Collating the questionnaire returns with the usable data on performance reduced the respondent universe to 43 firms; for each of these, the required data were punched into cards for high-speed processing and tabulating.

The basic plan of analysis was to separate the firms into groups of high and low performance, and to test their responses to each of the items on the questionnaire in terms of proportions of the universe; these proportions were then tested to determine their statistical significance, i. e., whether the high and low grouping cause a statistically significant change in response. In order to determine the proper size of the high and low groups, a test was made on the original performance criteria (1) by arraying each criterion in sequence, (2) selecting samples of a given size from the high and low ends of the array, and (3) testing the means and standard deviations of each of these samples for significance. It was found that by selecting the high and low (10 each) firms in each array, differences between means and standard deviations were significant at (at least) the 5 percent level. For the sake of consistency and conservative inference, this grouping was adopted for the proportion test.

The analysis then proceeded as follows:

- 1) Firms were first sequentially arrayed by a performance criterion, for example: mean units produced.
- 2) The array was trisected, placing the low 10 in one group, the middle 23 in another, and the remaining 10 in the high group.
- 3) The tabulating machine was wired to produce a scatter diagram of responses to each of the questions on the questionnaire, subtotalling the number of each type of response by group, and also computing a total frequency distribution.
- 4) From the scatter diagram, it could be observed whether or not any

pattern of response evolved for the low group versus the high group.

Where the pattern indicated a difference, the relevant proportions of response were tested statistically to determine whether the differences were significant. The test used was the standard two-tailed test for the significance of differences between two proportions, i. e., $\sigma_{D\%} =$

$\sqrt{pq \left(\frac{1}{N_1} + \frac{1}{N_2} \right)}$, where p = per cent occurrence of observed event to all events, q = (1-p), N_1 = number of events in low group, N_2 = number of events in high group, and D = observed difference in proportions of occurrence of the event in the low and high groups. The observed difference D is divided by the standard error of the difference $\sigma_{D\%}$ to put the observed difference into standard error units; tables of areas under the normal curve are then entered with the resulting number as argument to determine the degree of likelihood that the difference is due to chance rather than to some systemic cause. Since the test is two-tailed, we accept the 10 per cent level of confidence as the rejection criterion, i. e., we accept the difference as a true difference if it could occur by chance only 10 times out of 100.

- (5) Also analyzed are those patterns where we would expect to find differences between high and low groups, but where such differences do not exist. The absence of expected differences in response is, of course, quite as important as their presence, so long as the criterion upon which the judgment is made is relevant to the response being tested.

Analysis Matrix

Since five parameters were computed for each of the six performance criteria, and each of these thirty possible measures were to be evaluated for each of the 18 questionnaire responses, it became necessary to formalize the evaluation of

each of these 540 cells in order that some order be maintained in the analysis. To this end, a matrix was constructed (Table I) which simplified the evaluation of perceived means and ends in terms of the performance criteria. The output of the scatter-diagram-tabulating process was analyzed according to the rationality of the respondent groups, where by "rational behavior" is meant that the stated means or ends agree with the realized performance of the group. For example, the smaller firms might be expected to feel that less education is required than the larger firms (either because the manager of the smaller firm has a lower level of education himself, or he perceives that operating at smaller scale perhaps requires less "training"); at least, we define as rational a pattern of response which would support this argument.

The entries in the matrix were coded as follows:

- + significant difference; rational behavior
- significant difference; irrational behavior
- O difference not significant, but not expected to be significant
- ⊕ difference not significant, but indication of rationality
- ⊖ difference not significant, but indication of irrationality

Where no entries appear, the cross-classification was such that either no reasonable argument could be made one way or the other with respect to the meaning of the cell in the matrix; or the performance criterion did not lend itself to such analysis; or the total response to the question on the questionnaire was inconclusive. As examples of each of these respectively, we consider:

1. The meaning of the cross-classification of the answer to the diversification question and the volume of output criterion; no meaning can be ascribed to any of these cells since we do not know what function, if any, relates these ideas.

Table 1: SUMMARY OF SIGNIFICANT RESPONSES

Col	Units Produced					Return/Sq. Ft.					Units/Sq. Ft.					Size in Sq. Ft.					Total Revenue					Return/Unit				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
61 Education			+			⊕		⊖			⊖		⊕								⊖					+				
62 Career			+			⊖		-			⊖		+								⊕					⊖				
63 Tech. Change			+	⊕		⊕		+			⊕		⊕								⊕				⊕					
64 Quality Class			-			⊕		⊖			-		⊖								⊕				⊖					
65 Indiv. Prod. vs Quality			⊖	⊕		⊕		+			⊖		⊖								⊕				⊖					
66 Industry Prod. vs Quality			⊕	⊖							⊖														⊖					
67 Prod. Cost Knowledge			⊕	⊕		⊖		-			⊖		⊖								⊕				⊕					
70 Industry Problem																+														
71 Growth Plans			+	⊖							⊕		⊖			⊖					⊕				⊕					
72 Promotion Expense			+					⊖			⊕		⊕			⊕					⊕				⊕					
73 Diversification								⊖			⊕		⊕			⊖					⊕				⊕					
74 Ret. per unit (Quality)			⊖								⊖		⊖			⊕									⊖					
75 Quality																														
76 Return per Sq. Ft. (Process Intensity)			⊖			⊕		⊕			⊖		⊖			⊖					⊕				⊖					
77 Total Production (Scale)			⊖			⊕		⊕			⊖		⊖			⊖					⊕				⊖					
78 Net Profit			⊖			⊕		⊕			⊖		⊖			⊖					⊕				⊖					
79 Growth-Size			⊖								⊕		⊖			⊖					⊕				⊖					
80 Growth-Profit			⊕	⊖							⊖		⊖			⊖					⊕				⊖					

Symbol Legend

- + Sig. Diff., rational
 - Sig. Diff., irrational
 ⊖ Not Sig., expected
 ⊕ Not relevant
 ⊖ Not Sig., tendency for rationality
 ⊕ Not Sig., tendency for informality
 X No Diff., difference expected

Card No. Key

- 1 Growth Rate/year in Actual Units
 2 Standard Error of Actual Units
 3 Mean Actual Value
 4 Growth Rate/year in Logs of Actual Units
 5 Standard Error of Logs of Actual Units



2. The actual growth parameter and its standard error for volume of output; the size of the firms varies over such a wide range that an actual growth of 50 per cent for one firm might be only 10 per cent for another. These two criteria are thus excluded from the analysis in toto.
3. Growth in profit as a goal; this goal was either poorly understood by the respondents as a whole, or was dominated by the alternatives, since in none of the tabulating runs was anything developed that could be considered to be conclusive.

The analysis proceeds below by examining each of the questionnaire responses in terms of the relevant, or conclusive, performance criteria, i.e., for each response, we postulate a rational behavior pattern of the high versus the low group, and then test the relevant cells to determine whether the postulate can be accepted.

Analysis

Question 1: If you were advising a young person who wanted to go into this business, how much education would you tell him he ought to have?

Intent: Since many of the advances in technology enjoyed by this industry were developed at the State University, the management of individual firms is quite conscious of the role played by education, and in some cases is self-conscious about low levels of educational experience. Although the purpose of the question was to ascertain the relationship between educational level attained and performance, it was realized that answers to the question in this form might be biased by a rationalization of the firms' performance, ("since I did not go to college and am doing all right, it isn't necessary for this business"), or for other reasons.

Postulate: A rational judgment on the part of those managers at the relatively lower levels of performance would be that education is less important, while the converse would hold true for the better performers.

Empirical Result: Only one significant difference between low and high groups was found; on the basis of mean volume of output, i. e., units produced, the

Table 2: EDUCATION FELT TO BE REQUIRED FOR MANAGING THE BUSINESS VERSUS SIZE OF FIRM IN TERMS OF TOTAL PRODUCTION VOLUME.¹

	Group Median: Production Volume (6 yr. mean)	Percent Response Within Groups			
		Grade School	High School	College Degree	Graduate Degree
Low Group	320, 000	0	30	50	20
Middle Group	517, 000	0	27	54	19
High Group	1, 600, 000	0	0	70	30
High-Low Difference		0	-30	+20	+10

¹ Source: Plate No. 1-3-61, p. 77.

proportion of the low group stating that less education was required was significantly different from the proportion of the high group feeling the same way (Table 2). None of the respondents, however, felt that grade school was sufficient, while every member of the high group would recommend college training. Supporting the postulate of rationality, although not statistically significant, were similar results with respect to absolute growth in dollar return high group. The interesting pattern here (Table 3) is that the middle group of performers contained two-thirds of all those who felt that high school training was sufficient, and a smaller

proportion than either the high or low groups of those who felt that graduate study was important.

Table 3: EDUCATION FELT TO BE REQUIRED TO MANAGE THE BUSINESS VERSUS DOLLAR RETURN PER SQUARE FOOT OF PLANT.¹

		Percent Response Within Groups			
	Group Median: Dollar Return Per Sq. Ft. (6 yr. mean)	Grade School	High School	College Degree	Graduate Degree
Low Group	2.2002	0	10	60	30
Middle Group	2.8108	0	27	54	19
High Group	3.2815	0	20	60	20
High-Low Difference		0	+10	0	-10

¹Source: Plate No. 2-3-61, p. 78.

An even more striking pattern of the same type was generated by grouping according to mean production per square foot (mean intensity of process): none of the low performers recommended less than college training, while only one-fourth of those believing high school to be sufficient fell in the high group. When grouped by mean total revenue, an expected bias toward more education on the part of the high performer did not materialize; again, however, the high percentage of low performers recommending college and graduate work may be due to rationalization of their performance, i. e., "my problem is that I am undereducated."

Question 2: Considering all aspects (of this business) and alternative careers, would you advise anyone to select this business as a career?

Intent: The purpose of this question was to determine the general attitude of the decision maker toward the business that he was in. It is certainly possible that a negative response might be made in "hope" of deterring competition; yet this possibility was discarded because the depth interviews divulged the fact that it was not uncommon to feel that the business did not pay off in relation to the amount of hard work expended upon it.

Postulate: Better performance should be coupled with a positive attitude toward this kind of business.

Empirical Result: Two highly significant differences were found supporting the postulate, while three significant differences showed irrationality in this respect. When grouped by mean units produced, 40 percent of the low volume firms would recommend a career in the business, while 80 percent of the high volume group would make a positive recommendation (Table 4). Less than 50 percent of

Table 4: RECOMMENDATION OF THIS BUSINESS AS A CAREER VERSUS SIZE OF FIRM IN TERMS OF PRODUCTION VOLUME.¹

	Group Median: Production Volume (6 yr. mean)	Percent Response Within Groups	
		Recommended as Career	Not Recommended as Career
Low Group	320, 000	40	60
Middle Group	517, 000	43	57
High Group	1, 600, 000	80	20
High-Low Difference		+40	-40

¹ Source: Plate No. 1-3-62, p. 79.

the middle group had a positive attitude. When grouped by mean size, 50 percent of the low group were positive, while 80 percent of the high group were positive (Table 5).

Table 5: RECOMMENDATION OF THIS BUSINESS AS A CAREER VERSUS SIZE IN TERMS OF SQUARE FEET OF PLANT.¹

	Group Median: Sq. Ft. of Plant (6 yr. mean)	Percent Response Within Groups	
		Recommended as Career	Not Recommended as Career
Low Group	9, 170	50	50
Middle Group	17, 089	39	61
High Group	55, 255	80	20
High-Low Difference		+30	-30

¹Source: Plate No. 4-3-62, p. 80.

The tables were turned on the support of the postulate when firms were grouped by mean return per square foot: 80 percent of the low performers were positive, while only 20 percent of the low performers had a **negative** attitude (Table 6). This is especially surprising when the highest performers realized almost 100 percent more in dollar returns per square foot than the lowest performers, yet the five lowest firms had a unanimous positive attitude while the five highest were unanimously negative. This phenomenon might be explained by the fact that the best performers worked the hardest, and thus felt that their returns were insufficient to pay for the extra hard work. Almost as strongly

Table 6: RECOMMENDATION OF THIS BUSINESS AS A CAREER VERSUS DOLLAR RETURN PER SQUARE FOOT.¹

	Group Median: Dollar Return Per Sq. Ft. (6 yr. mean)	Percent Response Within Groups	
		Recommended as Career	Not Recommended as Career
Low Group	2.2002	80	20
Middle Group	2.8108	52	48
High Group	3.2815	20	80
High-Low Difference		-60	+60

¹ Source: Plate No. 2-3-62, p. 81.

negative were the results generated by grouping the firms by mean units produced per square foot (process intensity). Many of the firms in the high and low groups

Table 7: RECOMMENDATION OF THIS BUSINESS AS A CAREER VERSUS PROCESS INTENSITY (VOLUME PER SQUARE FOOT).¹

	Group Median: Production Per Sq. Ft. (6 yr. mean)	Percent Response Within Groups	
		Recommended as Career	Not Recommended as Career
Low Group	27.8546	80	20
Middle Group	31.3516	48	52
High Group	36.8505	30	70
High-Low Difference		-50	+50

¹ Source: Plate No. 3-3-62, p. 82.

of the previous classification appear in the same groups here (about 50 percent the same) (Table 7). The same reason for their attitude can be ventured for this result. Exactly the same result was obtained by grouping according to mean dollar return per unit; this very surprising condition resulted even though the constitution of the groups changed radically in terms of the firms included. Although the high performers realized as much as 40 percent more revenue per unit than the low performers, 80 percent of the low group had a positive attitude, while only 30 percent of the high group would recommend the business as a career (Table 8).

Table 8: RECOMMENDATION OF THIS BUSINESS AS A CAREER VERSUS DOLLAR RETURN PER UNIT.¹

	Group Median: Dollar Return Per Unit (6 yr. mean)	Percent Response Within Groups	
		Recommended as Career	Not Recommended as Career
Low Group	.0743	80	20
Middle Group	.0889	48	52
High Group	.0970	30	70
High-Low Difference		-50	+50

¹ Source: Plate No. 6-3-62, p. 83.

An interesting result of this analysis is that on the rationality criteria, the postulate was rejected significantly; while support for the postulate was given when firms were grouped according to absolute measures of performance (total volume, size, total revenue).

Question 3: How many production set-ups do you think ought to be made each year?

Intent: This question is related to the current polemic within the industry as to the proper technological practice to follow. Tradition dictates more set-ups in order to maintain quality since the process degenerates over time. There is currently some support for the notion that process degeneration, and higher costs, do not occur so rapidly, and thus set-ups are not required so often over a given time span. The elements of the argument are well understood by every decision maker in the industry, in any event, and thus the purpose of the argument is to determine attitudes toward change in traditionally accepted practices.

Postulate: The general attitude of the low performance group toward technological change will be less positive than the attitude of those who perform better.

Empirical Result: Some seventeen relevant observations were generated by this question, of which only one tended to reject the postulate, while five significant positive results were obtained; the balance tended to support the postulate. When grouped by total volume (both mean volume and relative growth in volume), the smaller producers tended to reject the new idea (Table 9). A rather confused picture emerges when grouped by mean return per square foot, since the low performers generally accept some change, while the high performers, generally in favor of change, have some members (30 percent) who are not in favor of the level of change championed by even the average low performer (Table 10). This difference may be attributed to a rationalization associated with a satisfactory level of performance attained by the high performers without such change. Grouping firms by absolute growth in process intensity forced the most resistant to change firms into the low group (Table 11). It should be noted that these firms in the low group share the characteristic that their growth in this performance measure is negative, i. e., over

Table 9: WILLINGNESS TO ACCEPT TECHNOLOGICAL CHANGE VERSUS SIZE IN TERMS OF PRODUCTION VOLUME.¹

		Percent Response Within Groups							
		Decrease in Set-ups		Measured by Percentage of Production Capacity					
Group	Median: Production Volume (6 yr. mean)	No carry-over (0)	10 per cent	20 per cent	30 per cent	40 per cent	50 per cent	60 per cent	70 per cent
Low Group	320,000	20	10	0	0	30	40	0	0
Middle Group	517,000	0	0	13	30	4	44	0	9
High Group	1,600,000	0	0	10	0	30	60	0	0
High-low Difference		-20	-10	+10	0	0	+20	0	0

¹ Source: Plate No. 1-3-63, p. 84.

Table 10: WILLINGNESS TO ACCEPT TECHNOLOGICAL CHANGE VERSUS DOLLAR RETURN PER SQUARE FOOT.¹

		Percent Response Within Groups							
		Decrease in Set-ups		Measured by Percentage of Production Capacity					
Group	Median: Dollar Return per Sq. Ft. (6 yr. mean)	No carry-over (0)	10 per cent	20 per cent	30 per cent	40 per cent	50 per cent	60 per cent	70 per cent
Low Group	2.2002	0	0	0	20	40	30	0	10
Middle Group	2.8108	9	0	9	22	13	43	0	4
High Group	3.2815	0	10	20	0	0	70	0	0
High-Low Difference		0	+10	+20	-20	-40	+40	0	-10

¹ Source: Plate No. 2-3-63, p. 85.

the six-year period the number of units produced per square foot had decreased by an average of one-half a unit per year, while the high group had increased by an average of two units per year. The general pattern of response on this question when grouped by this criterion also supports the postulate: those showing least improvement in the performance measure are least interested in change.

An interesting pattern emerges when firms are grouped by absolute increases in return per unit, for the high performance group shows more resistance to change than the low group, firms in which growth had been negative over the period under study (Table 12). This result seems to reject the postulate; however, in the sense that the poorer performers recognize change as a possible means for improvement, rather than traditional acceptance of technology as a goal, our general principle of rationality may be supportable.

Question 4: If it were possible to produce a product of only one quality grade, which grade would you concentrate on or be satisfied to produce?

Intent: The production of high quality units is realized through a higher degree of process control, and is assumed to reduce total volume. On the other hand, the revenue realized from high quality units is significantly higher than that realized from the standard product or the marginally acceptable units. The interpretation of rational behavior thus must be made on the basis of the criterion by which the firms are grouped; an overriding postulate based on performance category is not defensible.

Empirical Result: When grouped by mean production volume, significantly more large firms preferred to produce top quality than did the small firms (Table 13). (We note that although the respondents were offered a choice of producing all four grades, only the top two grades were selected as quality goals; the inference

Table 11: WILLINGNESS TO ACCEPT TECHNOLOGICAL CHANGE VERSUS YEARLY GROWTH IN PROCESS INTENSITY.¹

		Percent Response Within Groups									
		Decrease in set-ups as measured by percentage of production capacity which manager is willing to carryover									
Group Median:		No Carry-over	10 per cent	20 per cent	30 per cent	40 per cent	50 per cent	60 per cent	70 per cent		
Yearly Growth in Units Produced per Sq. Ft.		(0)									
Low Group	- .4208	20	0	10	0	20	50	0	0		
Middle Group	.7768	0	4	13	17	13	4	0	9		
High Group	2.0111	0	0	0	30	20	50	0	0		
High-Low Difference		-20	0	-10	+30	0	0	0	0		

¹Source: Plate No. 3-1-63, p. 86.

Table 12: WILLINGNESS TO ACCEPT TECHNOLOGICAL CHANGE VERSUS YEARLY GROWTH IN UNIT REVENUE.¹

		Percent Response Within Groups									
		Decrease in set-ups as measured by percentage of production capacity which manager is willing to carryover									
Group Median: Yearly Growth in Dollar Revenue per unit		No carry-over	10 per cent	20 per cent	30 per cent	40 per cent	50 per cent	60 per cent	70 per cent		
		(0)									
Low Group	- .0024	0	0	0	0	40	60	0	0		
Middle Group	- .0008	9	4	13	17	9	39	0	9		
High Group	.0012	0	0	10	30	10	50	0	0		
High-Low Group Difference		0	0	+10	+30	-30	-10	0	0		

¹Source: Plate No. 6-1-63, p. 87.

is that no firm is satisfied with "mill run" products.) Since quality is associated with restriction of output, this result is curious, although explainable in terms of a rationalized goal which may be honored only in the breach. To this end, then, the choice must be considered irrational. A similar result is obtained when firms are

Table 13: QUALITY PREFERENCE VERSUS PRODUCTION VOLUME.¹

	Group Median: Production Volume (6 yr. mean)	Percent Response Within Groups	
		High Quality	Standard Quality
Low Group	320,000	40	60
Middle Group	517,000	70	30
High Group	1,600,000	70	30
High-Low Difference		+30	-30

¹ Source: Plate No. 1-3-64, p. 88.

grouped by process intensity, i. e., mean volume per square foot (Table 14). It might be expected that the firms with low intensity would concentrate upon quality relative to such concentration by the high intensity firms; however, the reverse is indicated at a significant level. Again, the inference must be that an overriding implicit goal (perhaps production volume, or total revenue) dominates this explicit expression, indicating a confusion of means and ends and therefore, irrational behavior.

Only one relevant cross-classification tends to support the expected conclusion, occurring when firms are grouped by absolute growth in plant size (Table 15).

Table 14: QUALITY PREFERENCE VERSUS PROCESS INTENSITY.¹

	Group Median: Production per Sq. Ft. (6 yr. mean)	Percent Response Within Groups	
		High Quality	Standard Quality
Low Group	27.8546	40	60
Middle Group	31.3516	65	35
High Group	36.8505	80	20
High-Low Difference		+40	-40

¹ Source: Plate No. 3-3-64, p. 89.

In this case, those showing little or negative growth are more inclined toward the high quality products although the distinction is inconclusive. Otherwise, the

Table 15: QUALITY PREFERENCE VERSUS ACTUAL GROWTH PER YEAR IN PLANT SIZE.¹

	Group Median: Actual Growth in Plant Size (Sq. Ft.) Per Year	Percent Response Within Groups	
		High Quality	Standard Quality
Low Group	-565	70	30
Middle Group	1721	65	35
High Group	10280	50	50
High-Low Difference		-20	+20

¹ Source: Plate No. 5-1-64, p. 90.

tendency as indicated by grouping according to other relevant performance criteria is to support a contention of irrationality: quality is expressed as a goal, but it is not used as a means, i. e., the performance of the firms in general indicates that quality may be achieved only as a by-product of maximizing some other measures of performance, even though it is expressed as a primary, explicit, and desirable goal in itself.

Question 5: From the point of view of the individual firm, is it better to concentrate upon production volume, or upon quality output?

Intent: Since the goals of production volume and quality are presumably exclusive, i. e., one chooses one or the other, this question is pursued from the point of view of the firm. It is well recognized that the fate of the Colorado product in the national market depends upon an image of quality; this recognition is borne out by the answers to the next question (Question 6: From the point of view of the industry, is it better . . . etc.) which was answered 90 percent in favor of quality. However, only 65 percent of the respondents felt that the firm was better off to push quality. This raises the question of true self-interest: is the firm better off to follow the course which it perceives to be in its own best interest, or follow the tacit dictates of the industry without which the firm could probably not survive? The purpose of this question was to determine the performance characteristics which would cause the decision maker to choose one or the other for his firm.

Postulate: Low performers, who need the support of a healthy industry, should adjudge the quality goal of the industry to be more in the interest of their own firm, while the high group might be expected to be less disposed to the industry constraint.

Empirical Result: When grouped by mean return per square foot, a startling significant difference emerges to support the postulate (Table 16).

Table 16: CHOICE BETWEEN VOLUME AND QUALITY VERSUS DOLLAR RETURN PER SQ. FT.¹

	Group Median: Dollar Return Per Sq. Ft (6 yr. mean)	Percent Response Within Groups	
		Production Volume	Quality
Low Group	2.2002	10	90
Middle Group	2.8108	30	70
High Group	3.2815	70	30
High-Low Difference		+60	-60

¹ Source: Plate No. 2-3-65, p. 91.

Thus the rationale for low return per square foot appears to be a striving for quality. It should be noted that return per square foot depends upon quality itself; however, it is quite obvious that in terms of performance, the price differential in favor of quality is not sufficient to offset the dollar gains realized by maximizing production, perhaps at lower quality, per square foot of plant. On the other hand, when grouped by return per unit, aspirations and performance are significantly unrelated, (Table 17). The firms realizing the lowest return per unit (where this return depends upon the quality of the unit) placed quality over production volume as a goal; however, the firms enjoying highest returns per unit are as likely to consider volume as more important. Although these results support the postulate,

Table 17: CHOICE BETWEEN VOLUME AND QUALITY VERSUS
DOLLAR RETURN PER UNIT.¹

	Group Median: Dollar Return Per Unit (6 yr. mean)	Percent Response Within Groups	
		Production Volume	Quality
Low Group	.0743	10	90
Middle Group	.0889	39	61
High Group	.0970	50	50
High-Low Difference		+40	-40

¹ Source: Plate No. 6-3-65, p. 92.

it is certainly of interest that the low group would continue to maintain what is obviously an irrational point of view on goals in the light of their performance. Additional support for the postulate is derived by grouping according to volume per

Table 18: CHOICE BETWEEN VOLUME AND QUALITY VERSUS
PROCESS INTENSITY.¹

	Group Median: Production Per Sq. Ft. (6 yr. mean)	Percent Response Within Groups	
		Production Volume	Quality
Low Group	27.8546	10	90
Middle Group	31.3516	39	61
High Group	36.8505	50	50
High-Low Difference		+40	-40

¹ Source: Plate No. 3-3-65, p. 93.

square foot (Table 18). Since this measure of performance is exclusively related to volume in terms of process intensity, the significantly different proportion of low intensity producers relative to the high intensity firms indicates the validity of the postulate.

A curious result was derived by grouping according to absolute growth in actual size (Table 19). It might be expected that the firms showing relatively large growth per year would show a significant disposition toward production, relative to a disposition toward quality on the part of the firms which did not grow in size at all during the period. No difference whatsoever was observed. A similarly curious result ensued from grouping according to mean total revenue (Table 20). If one reasons that the high revenue firms identify themselves more closely with the industry problem, i. e., quality, then it is difficult to explain the point of view of the small firms whose response pattern was identical to that of the large firms. We note that the middle group responses do not follow the pattern at all.

Table 19: CHOICE BETWEEN PRODUCTION VOLUME AND QUALITY
VERSUS ACTUAL GROWTH IN PLANT SIZE.¹

	Group Median: Actual Growth in Plant Size (6 yr. mean)	Percent Response Within Groups	
		Production Volume	Quality
Low Group	-47	40	60
Middle Group	355	30	70
High Group	3147	40	60
High-Low Difference		0	0

¹ Source: Plate No. 4-1-65, p. 94.

Table 20: CHOICE BETWEEN PRODUCTION VOLUME AND QUALITY
VERSUS TOTAL DOLLAR REVENUE.¹

	Group Median: Total Dollar Revenue (6 yr. mean)	Percent Response Within Groups	
		Production Volume	Quality
Low Group	29,328	20	80
Middle Group	51,836	48	52
High Group	112,986	20	80
High-Low Difference		0	0

¹ Source: Plate No. 5-3-65, p. 95.

Question 6: From the point of view of the industry, is it better to concentrate upon high production or high quality?

Intent: As stated above, it is generally understood that the Colorado product is marketed and sold as a high quality product; maintenance of the market depends upon sustaining this image. The purpose of the question was to determine the extent of understanding of this concept; since 90 percent of the firms reported agreement with high quality as the proper industrial goal, analysis of response to this question could not be expected to develop anything meaningful because there were so few respondents in disagreement.

Question 7: Do you think you could do a better job if you knew the real cost of producing any given unit?

Intent: Although cost accounting procedures have been discussed with the individual firms through the trade association, unit production cost is either not

computed, or is non-comparable across firms because of highly individualized accounting methods. The relevant direct cost per unit, taking into account opportunity costs and managerial salaries, etc., is unknown, in any event; studies designed to determine this cost have usually been abandoned due to the complexities of data generation and interpretation. The purpose of asking the question was to determine the willingness or ability of the respondent to use such information, if it were available.

Postulate: Members of high groups should be more willing to accept the need for production cost information, since either their operations are more complex, or their performance has indicated a desire to make a more effective use of their resources.

Empirical Result: A striking rejection of the postulate is produced by grouping firms according to mean return per square foot (a function of volume per square foot, quality, and timing). Although some of the members of the low group felt that it would be impossible to find the unit production cost, all members of the group indicated that they would be able to do a better job with such information (Table 21). On the other hand, only 40 percent of the high group felt that such information would be useful. This decision is obviously made after the fact: if high performance is possible without such information, then it is not necessary. Thus the conclusion drawn in Stereotype II: certain firms view such information as a means for evaluating the results of decisions, rather than a means to make better decisions.

A similar result is found by grouping according to mean return per unit (Table 22). Ninety percent of firms with low product quality or poor production timing would use cost information if available; only half of the high performance group feel such information to be valuable. Because such information must be

Table 21: ATTITUDE TOWARD USEFULNESS OF PRODUCTION COST DATA
VERSUS DOLLAR RETURN PER SQUARE FOOT.¹

	Group Median: Dollar Return Per Sq. Ft. (6 yr. mean)	Percent Response Within Groups	
		Production Cost Data Useful ²	Production Cost Data Not Useful
Low Group	2. 2002	100	0
Middle Group	2. 8108	74	26
High Group	3. 2815	40	60
High-Low Difference		-60	+60

¹ Source: Plate No. 2-3-67, p. 96.

² Includes respondents who felt such data to be impossible to ascertain.

considered to be valuable for ex ante decision making, we must reject the postulate for this criterion and chalk up a success for the forces of irrationality. Although

Table 22: ATTITUDE TOWARD USEFULNESS OF PRODUCTION COST DATA
VERSUS DOLLAR RETURN PER UNIT.¹

	Group Median: Dollar Return Per Unit (6 yr. mean)	Percent Response Within Groups	
		Production Cost Data Useful ²	Production Cost Data Not Useful
Low Group	. 0743	90	10
Middle Group	. 0889	74	26
High Group	. 0970	50	50
High-Low Difference		-40	+40

¹ Source: Plate No. 6-3-67, p. 97.

² Includes respondents who felt such data to be impossible to ascertain.

the differences are not quite significant, the similar pattern of irrationality is borne out by grouping mean intensity of production and relative growth in total revenue. Two identical patterns of support for the postulate are generated by grouping according to mean production volume and mean size, both absolute measures, but the differences are not significant. In both cases it is interesting that most of the smaller firms are as concerned about acquiring cost information as the larger firms.

(Question 8 asked the respondent to give the number of people he employed.)

Question 9: Which of the following do you feel to be the most important problem facing the members of the Colorado industry at the present time? (National market competition, internal management practices, process technology, standardization of grading practices, or cooperative effort on part of all firms to assure future of the industry.)

Intent: This question reflected the general and basic problems mentioned in depth interviews. Certainly the alternatives are not exclusive, nor perhaps exhaustive. But our purpose was to generate patterns of concern about "global" problems, and while it was considered undesirable to restrict the alternatives unnecessarily, too many alternatives would have reduced possible significant proportions to non-significant and non-obvious differences. Since the last alternative was much more general than those preceding it, and "sounded good", its inclusion probably is responsible for the failure of the question to produce much of interest, since it received some 60 percent of the "votes". On the other hand, it is useful to note that the voting in general did follow a pattern of global interest (i. e., the broader problems received more attention than the specialized problems of the individual firms) indicating that the decision makers are capable of considering problems in the large, as the question intended.

Postulate: Members of the low performance groups will perceive the broader problems to be less important than the individual operating problems of the firm, when grouped by ratios. When ranked by absolutes, it is expected that internal problems may loom larger to the individual administrator of the large firm.

Table 23: DISTRIBUTION OF RESPONSE TO "MOST SERIOUS INDUSTRY PROBLEM" QUESTION.¹

	Percent Response				
	National Market Competition	Internal Management Practices	Process Technology	Standardization of Grading	Cooperative Industry Effort
All Groups	28	5	2	5	60

¹ Source: Plate No. 1-3-70, p. 98.

Empirical Result: The postulate must be rejected because of the general lack of awareness of the importance of individual firm problems relative to the global, industry problems (Table 23). However, the formulation of the question may have been responsible for this result.

Question 10: Have you made any plans for growth, either in terms of expansion of physical plant or for improvement in profits, etc., for say the next five years?

Intent: This direct question was posed to test whether the managements were disposed to look ahead as far as five years. It is realized that there is a "halo effect" about the idea of long-range planning, and thus a positive response may have been considered to be the "correct" answer, although some effort was put forth to assure the respondents that there were no "correct" answers to any of the questions. On the other hand, some who answered negatively may have felt that it was not

"practical" to plan so far ahead, even though they maintained relatively sophisticated short-range plans. In any event, responses are taken at their face value for the purpose of analysis.

Postulate: Better performance will be demonstrated by those who are willing to make long-range plans.

Table 24: LONG-RANGE PLANNING FOR GROWTH VERSUS SIZE
IN TERMS OF PRODUCTION VOLUME.¹

	Group Median: Production Volume (6 yr. mean)	Percent Response Within Groups	
		Five Year Growth Plans	No Long-Term Plans
Low Group	320,000	50	50
Middle Group	517,000	17	83
High Group	1,600,000	89	11
High-Low Difference		+39	-39

¹ Source: Plate No. 1-3-71, p. 99.

Empirical Result: Five significant groupings were found which supported the postulate, while one rejected it. Differences in proportions when grouped by other measures tended to support the postulate, although not significantly. Grouping by mean production volume (Table 24), mean total revenue, and mean size produced identical results with 50 percent of the smaller firms indicating no growth plans. Since these are absolute measures, it is not surprising that the results are so consistent relative to this question. The postulate is supported at a significant

Table 25: LONG-RANGE PLANNING FOR GROWTH VERSUS
DOLLAR RETURN PER UNIT.¹

	Group Median: Dollar Return Per Unit (6 yr. mean)	Percent Response Within Groups	
		Five Year Growth Plans	No Long-Term Plans
Low Group	.0743	70	30
Middle Group	.0889	68	32
High Group	.0970	100	0
High-Low Difference		+30	-30

¹ Source: Plate No. 6-3-71, p. 100.

level by grouping by the relative measure of return per unit, in that all of the high performers indicated growth plans (Table 25). Although grouping by intensity of

Table 26: LONG-RANGE PLANNING FOR GROWTH VERSUS
PROCESS INTENSITY.¹

	Group Median: Production Per Sq. Ft. (6 yr. mean)	Percent Response Within Groups	
		Five Year Growth Plans	No Long-Term Plans
Low Group	27.8546	89	11
Middle Group	31.3516	83	17
High Group	36.8505	50	50
High-Low Difference		-39	+39

¹ Source: Plate No. 3-3-71, p. 101.

production apparently produced results which negate the postulate, it must be realized that the 50 percent of the high intensity firms which have no growth plans may be restricted from expanding spatially by locational constraints, and thus have had to increase the intensity of their process (Table 26).

Question 11: Do you believe that the current marketing effort in behalf of the industry product is worth its cost?

Intent: As indicated earlier, the merchandising effort is institutional in nature, handled by the trade association and paid for by the firms through a fixed percentage levied against total revenue. As is generally true with regressive levies of this type, the smaller firms indicated in the depth interviews a tendency to feel that they were less well served by such expenditures relative to their contribution than the larger firms, even though their contribution was absolutely smaller.

Postulate: Smaller firms by absolute criteria are less interested in national marketing efforts.

Table 27: ATTITUDE TOWARD INDUSTRY INSTITUTIONAL ADVERTISING EXPENDITURES VERSUS SIZE IN TERMS OF PRODUCTION VOLUME.¹

	Group Median: Production Volume (6 yr. mean)	Percent Response Within Groups	
		Marketing Expenditures Valuable	Marketing Expenditures Not Valuable
Low Group	320, 000	70	30
Middle Group	517, 000	83	17
High Group	1, 600, 000	100	0
High-Low Difference		+30	-30

¹ Source: Plate No. 1-3-72, p. 102.

Empirical Result: The postulate was generally supported although but one significant difference was generated. When firms were grouped by mean production volume, half of all those firms with a negative attitude fell into the low group, while none fell into the high group, i. e., none of the larger firms felt that the promotion expenses were not worth their cost (Table 27).

Question 12: Do you believe that you could make more money by diversifying your production into products other than the single product which you now produce?

Intent: Although not a common practice, some firms produce or carry in inventory products other than the single product of the industry. The nature of the production process in itself is amenable to production of other similar products; but on the whole, only 12 percent of the firms felt that diversification would be more profitable. Even so, the incidence of those in favor of diversification offered some interesting results.

Postulate: Smaller and/or less successful firms will seek alternatives to to improve their performance.

Empirical Result: Two significant differences were found to support the postulate. When grouped by relative growth in size of plant, those growing at the more rapid rate were unwilling to consider the diversification alternative; while some of those showing negative growth would consider the alternative (Table 28). Another significant difference resulted from grouping by relative growth in return per unit, although the interpretation of this difference is difficult (Table 29). However, since the faster growing (relatively) firms are the smaller firms, it is not

Table 28: ATTITUDE TOWARD DIVERSIFICATION OF PRODUCT VERSUS
RELATIVE YEARLY GROWTH IN PLANT SIZE.¹

	Group Median: Relative (Log) Yearly Growth in Plant Size	Percent Response Within Groups	
		Diversification Feasible	Diversification Not Feasible
Low Group	-.0015	30	70
Middle Group	.0084	9	91
High Group	.0675	0	100
High-Low Difference		-30	+30

¹ Source: Plate No. 4-4-73, p. 103.

unreasonable to expect that along with improvement in unit return, they would seek other profitable alternatives.

Table 29: ATTITUDE TOWARD DIVERSIFICATION OF PRODUCT VERSUS
RELATIVE YEARLY GROWTH IN DOLLAR RETURN PER UNIT.¹

	Group Median: Relative (Log) Yearly Growth in Dollar Return Per Unit	Percent Response Within Groups	
		Diversification Feasible	Diversification Not Feasible
Low Group	-.0152	0	100
Middle Group	-.0044	9	91
High Group	.0055	30	70
High-Low Difference		+30	-30

¹ Source: Plate No. 6-4-73, p. 104.

As a test of consistency, each respondent was asked to rank some of the measures of performance used in the study, and some other possible measures, in the order in which he perceived them to be important. Realizing that to prize a given goal highly is not sufficient to guarantee its realization, it is not importune to expect that firms should do best in those criteria which they explicitly state to be the most important.

Each of the criteria ranked was tabulated to determine the number of "votes" given to it, and cross-tabulated by grouping according to relevant performance criteria. Table 30 shows the gross tabulation of votes given to each of the criteria; the totals divulge the number of first place rankings, second place rankings, etc., of each criterion. A weighted score for each measure is computed to judge the industry-wide attitude toward importance of the criteria. (Score = (No. firsts x 7) + (No. seconds x 6) + . . . + (No. sevenths x 1)).

The analysis by grouping proceeded as before, and the results for each criterion appear below.

Return per Unit. Expectation is that those performing well in this category will rank this measure relatively high (Table 31). Although there is some support for this point of view since two of the high performance firms selected this measure as of prime importance, it should be noted that the low group also placed the measure relatively high.

Quality. Assuming that return per unit is the most sensitive criterion with respect to quality, grouping firms by mean return per unit should force a high vote for quality from the higher performers (Table 32). It is surprising that this point of view was supported by only 10 percent of the high group, while 40 percent of the weakest performers ranked quality their number one measure of performance.

Return per Square Foot. Grouping by mean return per square foot, expected

Table 30: GROSS TABULATION OF RANKING GIVEN THE VARIOUS PERFORMANCE CRITERIA BY RESPONDENTS.

Rank	Performance Criteria	First Place Votes/Score (X7)	Second Place Votes/Score (X6)	Third Place Votes/Score (X5)	Fourth Place Votes/Score (X4)	Fifth Place Votes/Score (X3)	Sixth Place Votes/Score (X2)	Seventh Place Votes/Score (X1)	Sum of Scores
4	Return Per Unit	3 / 21	11 / 66	10 / 50	9 / 36	7 / 21	0 / 0	0 / 0	194
3	Quality	10 / 70	7 / 42	8 / 40	5 / 20	8 / 24	2 / 4	0 / 0	200
2	Return Per Sq. Ft.	6 / 42	8 / 48	12 / 60	12 / 48	1 / 3	1 / 2	1 / 1	204
6	Total Production	1 / 7	3 / 18	2 / 10	6 / 24	9 / 27	11 / 22	9 / 9	117
1	Net Profit	20 / 140	4 / 24	3 / 15	5 / 20	5 / 15	3 / 6	0 / 0	220
7	Growth in Size	0 / 0	1 / 6	1 / 5	1 / 4	3 / 9	11 / 22	23 / 23	69
5	Growth in Profit	1 / 7	6 / 36	4 / 20	2 / 8	9 / 27	13 / 26	5 / 5	129

¹Source: Plate Nos. 1-3-74, 75, 76, 77, 78, 79, 80; pages 105, 106, 107, 108, 109, 110, 111.

Table 31: ANALYSIS OF RETURN PER UNIT AS EX ANTE PERFORMANCE CRITERION VERSUS EX POST REALIZATION OF RETURN PER UNIT.¹

	Group Median: Dollar Return Per Unit (6 yr. mean)	First Place Votes	Second Place Votes	Third Place Votes	Fourth Place Votes	Fifth Place Votes	Sixth Place Votes	Seventh Place Votes
Low Group	.0743	0	3	4	1	2	0	0
Middle Group	.0889	1	6	5	6	3	0	0
High Group	.0970	2	2	1	2	2	0	0

¹Source: Plate No. 6-3-74, p. 112.

Table 32: ANALYSIS OF QUALITY AS EX ANTE PERFORMANCE CRITERION VERSUS EX POST REALIZATION OF QUALITY PERFORMANCE.¹

	Group Median: Dollar Return Per Unit (6 yr. Mean)*	First Place Votes	Second Place Votes	Third Place Votes	Fourth Place Votes	Fifth Place Votes	Sixth Place Votes	Seventh Place Votes
Low Group	.0743	4	2	1	1	1	1	0
Middle Group	.0889	5	4	4	2	5	1	0
High Group	.0970	1	1	3	2	2	0	0

*Measure most sensitive to quality of output

¹Source: Plate No. 6-3-75, p. 113.

support for this measure from firms realizing high return per square foot failed to materialize, and conversely, low performers had a tendency to rank the measure higher than the high performers ranked it (Table 33).

Total Production. An expected high vote for total production did not materialize on behalf of the high volume group; perhaps this result can be attributed to the fact that high volume producers may in turn be oriented to profit, or have cast their votes for other measures.

Net Profit. Although no net profit performance figures were available for the study, it seemed reasonable to include such a measure of performance among the alternatives. A significant difference was generated by grouping firms by absolute growth in return per unit, with the result that 50 percent of those firms showing most deterioration in performance over time in return per unit were highly profit oriented, while the profit orientation pattern of the high firms was inconclusive (Table 34).

Growth in Size. Although there is some tendency toward interest in growth on the part of the larger and more successful firms, there was no statistically significant support for this measure.

Growth in Profit. Since there were no measures available bearing directly on profit, it was not unexpected that meaningful results for this criterion might not be generated.

Table 33: ANALYSIS OF RETURN PER SQUARE FOOT AS EX ANTE PERFORMANCE CRITERION VERSUS
EX POST REALIZATION OF RETURN PER SQUARE FOOT.¹

	Group Mean: Dollar Return Per Sq. Ft. (6 yr. mean)	First Place Votes	Second Place Votes	Third Place Votes	Fourth Place Votes	Fifth Place Votes	Sixth Place Votes	Seventh Place Votes
Low Group	2.2002	2	2	4	2	0	0	0
Middle Group	2.8108	3	5	5	8	0	0	0
High Group	3.2815	1	1	3	2	1	1	1

¹Source: Plate No. 2-3-76, p. 114.

Table 34: ANALYSIS OF NET PROFIT AS EX ANTE PERFORMANCE CRITERION VERSUS EX POST
REALIZATION OF YEARLY GROWTH IN DOLLAR RETURN PER UNIT.¹

	Group Median: Yearly Growth in Dollar Re- turn Per Unit	First Place Votes	Second Place Votes	Third Place Votes	Fourth Place Votes	Fifth Place Votes	Sixth Place Votes	Seventh Place Votes
Low Group	- .0024	5	2	0	2	0	1	0
Middle Group	- .0008	13	1	2	1	4	0	0
High Group	.0012	2	1	1	2	1	2	0

¹Source: Plate No. 6-1-78, p. 115.

Chapter VII

CONCLUSIONS AND RECOMMENDATIONS

Critique of the Research

From among the many firms and industries which might have been studied from the point of view taken at the conception of the study, it was necessary to choose a respondent universe having various characteristics which were either good or bad depending upon one's research orientation. The industry chosen did present some serious problems in terms of cost data availability, but the availability and comparability of other data and the cooperativeness of the firms in the industry indicated that the shortcomings of the universe chosen were small, especially considering alternative choices of a study universe.

Nonetheless, there is no doubt that many of the assumptions which had to be made during the course of analysis could have been avoided, or replaced with fact, had the proper data been available. This is not a criticism of this industry any more than it is a criticism of business in general; businessmen just do not generally understand the importance or use of internally generated data which can be processed into information for decision making.

Although we initially felt it to be fortunate that so many years of data were available, the high degree of statistical variance in growth parameters precluded some of the analysis originally contemplated. The analytical design which was formulated to replace the original design was effective in providing many insights into the decision making behavior of the firms, although the original intent of devising some linear decision rules had to be abandoned.

The survey questionnaire was generally successful in providing what we had hoped to derive from it, as indicated by pretest, although certain ambiguities did arise when applied over the entire universe. The high degree of response illustrates the cooperative attitude of most of the firms in the industry.

Conclusions

I. In the analysis of the attitudes of the administrators studied, it became quite apparent that the postulates of rationality generally assumed by the economist as dictating the behavior of the businessman must be tempered in the case of the small business operator. For there is a decided difference between the latter and the professional, or hired, manager; it is submitted that this difference is basic and poorly understood. There are in fact three compelling factors in this difference which may be concluded from the study:

1. The type of administrator involved in the study is a goal setter as well as an alternative chooser; i. e., he specifies the ends to be attained as well as the means by which they are to be attained. This specification will generally not be explicit and may not even be intuitively understood by the manager.
2. The administrator specifies goals after the fact, especially when his performance is either very good by some criteria, or very bad by others. This process of rationalization was perhaps the most striking aspect of the analysis, not because it is not a very human trait, but because the general concept of administration insists that goals be specified ex ante, and then the means specified for their attainment.
3. Like his professional counterpart, the administrator is concerned with intangible personality considerations, and is involved with his

ego in terms of status, perceived intelligence, etc. Unlike professional management, however, where such things represent only constraints upon behavior, this administrator will (perhaps implicitly) specify these factors of personality involvement as goals which he desires to attain.

II. One aspect of administration of the "small" business, as discussed above, is that which deals with the ability of the administrator to come to terms with a set of rational, i. e., ex ante, goals. A second aspect deals with the way in which goals are attained, be they explicit, implicit, rational or irrational.

1. Where operating decisions are made in the absence of a set of explicit goals, alternatives are chosen either on the basis of historical precedent, tradition, or folklore; or by following the leader. The latter is of interest because the "leader" may not even be well identified, but exists as a mélange of opinion. Performance must necessarily be evaluated on the basis of some ex post rationalization of conduct fitting the perceived norm.
2. Even where objectives are explicitly stated, it is evident that what information is available is used in ex post analysis of performance, rather than in the ex ante evaluation of the payoffs associated with alternative courses of action. (For example, financial records of the firm are maintained primarily to meet the requirements of the Internal Revenue Service or other outside agencies, with no regard for their relevance to internal control functions.)
3. Failure to appreciate the importance of control information before the fact results in a situation where relevant data are neither generated nor processed for ex ante evaluation of alternatives. (For

example, the problem of proper set-up time cannot be approached in terms of historical process data, since they have not been collected. The general willingness of the respondents to express an opinion on this matter, supported only by some intuitive feeling about what happened in the past, means that the administrators are willing to accept large ranges of possible results, perhaps in the belief that more accurate data cannot be found.)

III. The final aspect of administration as it is conceived in this industry deals with the administrative process itself. It is quite obvious that there is absent from among firms in this industry, and probably generally among "small" businesses, an appreciation of the basic nature of the administrative process: decision making relative to goals and alternatives. The irrational patterns of behavior developed in the analysis undoubtedly result more from this deficiency than from any specific area of inexperience of the individual manager. This is exemplified by a willingness to live in an environment of incomplete information: were it available, there would be a serious question as to how it ought to be used. A serious area of incomplete information is that which includes alternatives available to the manager. Except for a very few innovators, most managers perceive themselves as constrained within very narrow limits of choice of operating alternatives. Thus their decision latitude is also very narrow, and consists primarily of "fine-tuning" of their process within the constraints perceived as given.

Recommendations

It is hoped that the conclusions above are accepted not as pure criticism of the firms studied, for in fact, these firms have proved their viability and some have proved their ability to grow in a healthy fashion. The practical purpose of this report has been to find out whether it is possible to define a common base of "small"

business which will provide a rationale for general and specific programs of assistance to such businesses. In the light of the findings that the small businessman is unique in the manner in which he rationalizes means and ends, confuses constraints with alternatives, and operates under incomplete information, these recommendations are made:

1. General programs of assistance to small business should deal with the nature of the administrative decision process in toto, i. e., the choice of objectives, the search for alternatives, the evaluation of alternatives relative to the objectives, and the rules of decision which will dictate optimal choices. Included in such programs should be the problems of risk and uncertainty, and some of the tools with which the businessman can successfully attack his problems. In the recent past, sufficient intelligence about the decision problem has been generated that educational programs of this type are now feasible, and certainly important; the failure of many Colleges of Business Administration to accept this point of view is notwithstanding.
2. Specific programs of assistance, i. e., to individual firms, should be directed to the problem of constructing meaningful information systems whose purpose is to generate data for decision making relevant to the goals of the individual firm. Given the conditions for survival of the industry of which it is a part, there can be no doubt that the really crucial information to firm viability is that which is generated internally.
3. With regard to the industry studied, the information problem is undoubtedly critical to further research. Although many manipulations

of the great volume of data collected for this study are possible, it is felt that, without standard cost data, little more can be done than to retest the postulates and assumptions made herein. On the other hand, there can be no doubt that such a program of cost research could result in significant contributions to the decision making behavior of the firms in the industry, and perhaps assist in guaranteeing the viability of the industry in the future.

APPENDIX A

QUESTIONNAIRE

QUESTIONNAIRE

(Please Ignore the Punch-Card Code in the Left Margin.)

Directions: Just circle the number of the answer which best represents your opinion on the following questions. Please answer all questions, even if you only lean slightly toward one direction rather than another.

Col 61 If you were advising a young person who wanted to go into this business, how much education would you tell him he ought to have?

1 - Grade School 2 - High School 3 - College 4 - Graduate
(4 yr.)

Col 62 Considering all aspects and alternative careers, would you advise anyone to select this business as a career?

1 - Yes 2 - No

Col 63 What percent of your production capacity (set-up) do you think ought to be carried over each year? (Choose nearest percent)

0 - None 1-10 percent 2-20 percent 3-30 percent 4-40 percent
5-50 percent 6-60 percent 7-70 percent 8-80 percent 9-90 percent
X-100 percent

Col 64 If it were possible to produce only one grade, which grade would you concentrate on, or be satisfied to produce?

1 - Fancy 2 - Standard 3 - Grade 3 4 - Grade 4

Col 65 From the point of view of the individual firm, is it better to concentrate upon high production or high quality?

1 - Production 2 - Quality

Col 66 From the point of view of the industry, is it better for Colorado firms to concentrate upon production or quality?

1 - Production 2 - Quality

Col 67 Do you think you could do a better job if you knew the real cost of producing any given unit?

1 - Yes 2 - No

Col 68-69 How many people do you employ? (Excluding yourself) _____

Col 70 Which of the following do you feel to be the most important problem facing Colorado firms at this time?

- 1 - National market competition 2 - Internal management practices
3 - Production technology (carryover, etc.) 4 - Standard Quality Control
5 - A real cooperative effort of all firms to assure a future for the Colorado industry

Col 71	Have you made any plans for growth, either in terms of physical expansion or for improvement in profits, etc., for the next five years?
--------	---

- 1 - Yes 2 - No 3 - Don't understand the question

Col 72	Do you believe that the current marketing effort for your product is worth its cost?
--------	--

- 1 - Yes 2 - No

Col 73 Do you believe that you can make more money by diverting some of your production to other products?

- 1 - Yes 2 - No

If you were to assess your performance as a businessman, you might use any or all of the following measures of performance. Please indicate which of these you consider to be of most, and least, relative importance, by writing a "1" next to the most important, and a "2" next to the second most important, and so forth; the least in relative importance should have the number "7" written next to it. (This kind of question is rather hard to answer, but the best results are usually obtained by indicating your first impressions, without thinking a great deal about the alternatives, and then not changing your answers.)

Col 74	Return per unit
--------	-----------------

Col 75	Quality
--------	---------

Col 76	Return per square foot of plant
--------	---------------------------------

Col 77	Total Production
--------	------------------

Col 78	Net Profit
--------	------------

Col 79	Growth in size of operation or total produced
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
23	23
24	24
25	25
26	26
27	27
28	28
29	29
30	30
31	31
32	32
33	33
34	34
35	35
36	36
37	37
38	38
39	39
40	40
41	41
42	42
43	43
44	44
45	45
46	46
47	47
48	48
49	49
50	50
51	51
52	52
53	53
54	54
55	55
56	56
57	57
58	58
59	59
60	60
61	61
62	62
63	63
64	64
65	65
66	66
67	67
68	68
69	69
70	70
71	71
72	72
73	73
74	74
75	75
76	76
77	77
78	78
79	79
80	80
81	81
82	82
83	83
84	84
85	85
86	86
87	87
88	88
89	89
90	90
91	91
92	92
93	93
94	94
95	95
96	96
97	97
98	98
99	99
100	100

Col 80 Yearly growth in total receipts

APPENDIX B

KEY TO ANALYSIS DIAGRAMS

Key to Analysis Diagrams

The following diagrams represent the basic source of information used in Chapter VI. Each follows the same general format: in the left column the values of the performance criterion under scrutiny are arrayed in ascending order. There is one entry for each firm; the low-ranked firms are at the top of the diagram, and the high-ranked firms are at the bottom. In the body of the table is the scatter diagram formed by cross-tabulating against the responses to a given question. Group totals are carried down, as well as a major check total for the diagram.

Each diagram is identified by a plate number, which keys the diagram to the performance criterion, the statistical parameter used, and the question whose response is being tested, in that order. Those numbers are decoded as follows:

Performance Criterion (first digit)

- 1 Total production (units)
- 2 Dollar return per square foot of plant
- 3 Units produced per square foot of plant
- 4 Size of plant in square feet
- 5 Total dollar revenue
- 6 Dollar return per unit

Statistical Parameter (second digit)

- 1 Yearly growth in actual units (straight line)
- 2 Standard error of parameter in (1)
- 3 Mean value for six-year period
- 4 Yearly growth; logarithms of actual units
- 5 Standard error of (4)

Question Number (last two digits)

The question numbers on the questionnaire are keyed to IBM card columns, and commence with column 61. In Chapter VI, the questions are numbered sequentially from 1, but correspond one-for-one with the questionnaire numbering.

APPENDIX C

ANALYSIS DIAGRAMS

Plate 1-3-61: EDUCATION FELT TO BE REQUIRED FOR MANAGING THE
BUSINESS VERSUS SIZE OF FIRM IN TERMS OF TOTAL
PRODUCTION VOLUME.¹

	RESPONSE NUMBER								
	1	2	3	4	5	6	7	X	T
213470				1					1
221562			1						1
247533		1							1
269451			1						1
316344			1						1
338037		1							1
338883			1						1
343237				1					1
344562			1						1
412395		1							1
LO GROUP		3	05	02	00	00	00	00	10
440298				1					1
448055			1						1
448441			1						1
449350		1							1
453825			1						1
457604				1					1
457712								1	1
468293		1							1
471827			1						1
506046			1						1
516020				1					1
517112			1						1
546710			1						1
558675		1							1
639630			1						1
670426			1						1
686670			1						1
686926			1						1
745133		1							1
793517		1							1
859605			1						1
915179		1							1
921065				1					1
MD GROUP		6	12	04	00	00	00	01	23
1033295				1					1
1076942			1						1
1109242			1						1
1156916				1					1
1522757			1						1
1769466			1						1
1782610			1						1
1784258			1						1
1818542				1					1
2168118			1						1
HI GROUP			7	03	00	00	00	00	10
TOTAL									
	9	24	09	00	00	00	01	43	

¹ See Table 2, p. 32.

Plate 2-3-61: EDUCATION FELT TO BE REQUIRED TO MANAGE THE BUSINESS
VERSUS DOLLAR RETURN PER SQUARE FOOT OF PLANT.¹

RESPONSE NUMBER									
	1	2	3	4	5	6	7	X	T
2.0400			1						1
2.0516			1						1
2.1083				1					1
2.1366			1						1
2.1687			1						1
2.2316			1						1
2.2716				1					1
2.2938			1						1
2.2946				1					1
2.3016		1							1
LO GROUP		1	06	03	00	00	00	0	10
2.3212			1						1
2.3966		1							1
2.4926			1						1
2.5029			1						1
2.5466			1						1
2.5505			1						1
2.6359			1						1
2.6377		1							1
2.6801				1					1
2.7006			1						1
2.7361			1						1
2.8108								1	1
2.8686				1					1
2.8823				1					1
2.8846			1						1
2.9116			1						1
2.9340				1					1
2.9847			1						1
2.9989		1							1
3.0093		1							1
3.1301		1							1
3.1470			1						1
3.1612		1							1
MD GROUP		6	12	04	00	00	00	01	23
3.1747		1							1
3.1970			1						1
3.2224				1					1
3.2425			1						1
3.2553		1							1
3.3076			1						1
3.4036			1						1
3.4714			1						1
3.5852			1						1
3.9078				1					1
HI GROUP		2	06	02	00	00	00	0	10
TOTAL		9	24	09	00	00	00	01	43

¹ See Table 3, p. 33.

Plate 1-3-62: RECOMMENDATION OF THIS BUSINESS AS A CAREER VERSUS
SIZE OF FIRM IN TERMS OF PRODUCTION VOLUME.¹

		RESPONSE NUMBER							
		1	2	3	4	5	6	7	X T
213470	1								1
221562			1						1
247533			1						1
269451			1						1
316344			1						1
338037	1								1
338883	1								1
343237	1								1
344562			1						1
412395			1						1
LO GROUP	4	06	00	00	0				10
440298	1								1
448055			1						1
448441	1								1
449350	1								1
453825			1						1
457604	1								1
457712			1						1
468293			1						1
471827			1						1
506046			1						1
516020	1								1
517112	1								1
546710	1								1
558675			1						1
639630	1								1
670426	1								1
686670			1						1
686926			1						1
745133	1								1
793517			1						1
859605			1						1
915179			1						1
921065			1						1
MD GROUP	10	13	00	00	0				23
1033295	1								1
1076942	1								1
1109242			1						1
1156916			1						1
1522757	1								1
1769466	1								1
1782610	1								1
1784258	1								1
1818542	1								1
2168118	1								1
HI GROUP	8	02	00	00	0				10
TOTAL	22	21	00	00	0				43

¹ See Table 4, p. 34.

Plate 4-3-62: RECOMMENDATION OF THIS BUSINESS AS A CAREER VERSUS
SIZE IN TERMS OF SQUARE FEET OF PLANT.¹

		RESPONSE NUMBER								
		1	2	3	4	5	6	7	X	T
7230			1							1
7634			1							1
7684		1								1
8215			1							1
8828			1							1
9519			1							1
9613		1								1
10133		1								1
11221		1								1
13516		1								1
LO GROUP		5	05	00	00	0				10
13631			1							1
13928			1							1
13947		1								1
14199			1							1
15017		1								1
15436			1							1
15888			1							1
16143		1								1
16400		1								1
16879		1								1
16918			1							1
17089			1							1
17353		1								1
17668			1							1
17815			1							1
21100			1							1
22305		1								1
22512			1							1
23991		1								1
24097			1							1
24413		1								1
25611			1							1
27771			1							1
MD GROUP		9	14	00	00	0				23
28282		1								1
30018			1							1
32124		1								1
34678			1							1
51579		1								1
59472		1								1
60496		1								1
62062		1								1
67979		1								1
79267		1								1
HI GROUP		8	02	00	00	0				10
TOTAL		22	21	00	00	0				43

¹ See Table 5, p. 35.

Plate 2-3-62: RECOMMENDATION OF THIS BUSINESS AS A CAREER VERSUS
DOLLAR RETURN PER SQUARE FOOT.¹

	RESPONSE NUMBER								
	1	2	3	4	5	6	7	X	T
2.0400	1								1
2.0516	1								1
2.1083	1								1
2.1366	1								1
2.1687	1								1
2.2316		1							1
2.2716	1								1
2.2938	1								1
2.2946	1								1
2.3016		1							1
LO GROUP	8	02	00	00	0				10
2.3212	1								1
2.3966	1								1
2.4926	1								1
2.5029		1							1
2.5466	1								1
2.5505		1							1
2.6359	1								1
2.6377		1							1
2.6801	1								1
2.7006		1							1
2.7361		1							1
2.8108		1							1
2.8686	1								1
2.8823	1								1
2.8846		1							1
2.9116	1								1
2.9340	1								1
2.9847	1								1
2.9989		1							1
3.0093		1							1
3.1301	1								1
3.1470		1							1
3.1612		1							1
MD GROUP	12	11	00	00	0				23
3.1747	1								1
3.1979		1							1
3.2224		1							1
3.2425	1								1
3.2553		1							1
3.3076		1							1
3.4036		1							1
3.4714		1							1
3.5852		1							1
3.9078		1							1
HI GROUP	2	08	00	00	0				10
TOTAL	22	21	00	00	0				43

¹ See Table 6, p. 36.

Plate 3-3-62: RECOMMENDATION OF THIS BUSINESS AS A CAREER VERSUS
PROCESS INTENSITY (VOLUME PER SQUARE FOOT).¹

	RESPONSE NUMBER								
	1	2	3	4	5	6	7	X	T
26.2065	1								1
26.5408	1								1
27.3110	1								1
27.6188		1							1
27.8426	1								1
27.8665	1								1
28.6011		1							1
28.6826	1								1
28.7000	1								1
29.0200	1								1
LO GROUP	8	02	00	00	0				10
29.0293		1							1
29.6151		1							1
29.6530		1							1
29.7983		1							1
29.8583	1								1
30.0550	1								1
30.5250	1								1
30.6920	1								1
30.9833		1							1
31.0583	1								1
31.1478		1							1
31.3516		1							1
31.3803	1								1
31.4610	1								1
31.9906		1							1
32.1010	1								1
32.1771	1								1
32.4863		1							1
32.5188		1							1
32.5298	1								1
32.6285		1							1
32.6430	1								1
33.0508		1							1
MD GROUP	11	12	00	00	0				23
33.2246		1							1
33.3110	1								1
34.2301		1							1
34.5116	1								1
35.7545		1							1
37.9466	1								1
38.3236		1							1
38.5878		1							1
38.6073		1							1
40.7445		1							1
HI GROUP	3	07	00	00	0				10
TOTAL	22	21	00	00	0				43

¹ See Table 7, p. 36.

Plate 6-3-62: RECOMMENDATION OF THIS BUSINESS AS A CAREER VERSUS
DOLLAR RETURN PER UNIT.¹

	RESPONSE NUMBER								
	1	2	3	4	5	6	7	X	T
.0683	1								1
.0705	1								1
.0708	1								1
.0741	1								1
.0742		1							1
.0744	1								1
.0745	1								1
.0751		1							1
.0768	1								1
.0773	1								1
LO GROUP	8	02	00	00	0				10
.0823	1								1
.0828	1								1
.0828	1								1
.0833	1								1
.0839		1							1
.0858		1							1
.0872	1								1
.0873	1								1
.0875		1							1
.0883	1								1
.0884		1							1
.0889		1							1
.0892		1							1
.0901		1							1
.0902		1							1
.0904		1							1
.0934		1							1
.0934	1								1
.0935	1								1
.0942		1							1
.0947		1							1
.0953	1								1
.0956	1								1
MD GROUP	11	12	00	00	0				23
.0960		1							1
.0961	1								1
.0961		1							1
.0962		1							1
.0963	1								1
.0978		1							1
.0981		1							1
.1011	1								1
.1017		1							1
.1042		1							1
HI GROUP	3	07	00	00	0				10
TOTAL	22	21	00	00	0				43

¹ See Table 8, p. 37.

Plate 1-3-63: WILLINGNESS TO ACCEPT TECHNOLOGICAL CHANGE VERSUS
SIZE IN TERMS OF PRODUCTION VOLUME.¹

RESPONSE NUMBER										
	C	1	2	3	4	5	6	7	X	T
213470					1					1
221562	1									1
247533					1					1
269451						1				1
316344						1				1
338037		1								1
338883					1					1
343237	1									1
344562						1				1
412395						1				1
LO GROUP	2	01	00	00	03	04	00	00	00	10
440298						1				1
448055				1						1
448441						1				1
449350						1				1
453825			1							1
457604						1				1
457712				1						1
468293				1						1
471827						1				1
506046								1		1
516020						1				1
517112						1				1
546710					1					1
558675				1						1
639630				1						1
670426				1						1
686670						1				1
686926						1				1
745133						1				1
793517				1						1
859605								1		1
915179			1							1
921065			1							1
MD GROUP			3	07	01	10	00	02	00	23
1033295						1				1
1076942						1				1
1109242						1				1
1156916						1				1
1522757					1					1
1769466						1				1
1782610					1					1
1784258					1					1
1818542						1				1
2168118			1							1
HI GROUP			1	00	03	06	00	00	00	10
TOTAL	2	01	04	07	07	20	00	02	00	43

¹ See Table 9, p. 39.

Plate 2-3-63: WILLINGNESS TO ACCEPT TECHNOLOGICAL CHANGE VERSUS
DOLLAR RETURN PER SQUARE FOOT.¹

RESPONSE NUMBER										
	0	1	2	3	4	5	6	7	X	T
2.0400						1				1
2.0516					1					1
2.1083						1				1
2.1366					1					1
2.1687					1					1
2.2316								1		1
2.2716						1				1
2.2938				1						1
2.2946					1					1
2.3016				1						1
LO GROUP				2	04	03	00	01	00	10
2.3212						1				1
2.3966						1				1
2.4926				1						1
2.5029						1				1
2.5466					1					1
2.5505			1							1
2.6359			1							1
2.6377						1				1
2.6801						1				1
2.7006				1						1
2.7361	1									1
2.8108				1						1
2.8686	1									1
2.8823						1				1
2.8846						1				1
2.9116						1				1
2.9340						1				1
2.9847					1					1
2.9989				1						1
3.0093				1						1
3.1301						1				1
3.1470								1		1
3.1612					1					1
MD GROUP	2	00	02	05	03	10	00	01	00	23
3.1747		1								1
3.1979						1				1
3.2224						1				1
3.2425						1				1
3.2553			1							1
3.3076						1				1
3.4036						1				1
3.4714						1				1
3.5852						1				1
3.9078			1							1
HI GROUP		1	02	00	00	07	00	00	00	10
TOTAL	2	01	04	07	07	20	00	02	00	43

¹ See Table 10, p. 39.

Plate 3-1-63: WILLINGNESS TO ACCEPT TECHNOLOGICAL CHANGE VERSUS
YEARLY GROWTH IN PROCESS INTENSITY.¹

	RESPONSE NUMBER									
	0	1	2	3	4	5	6	7	X	T
-.8185						1				1
-.5740	1									1
-.5102						1				1
-.4898						1				1
-.4414					1					1
-.4002			1							1
-.2444						1				1
-.1612						1				1
-.1381	1									1
-.1214					1					1
LO GROUP	2	00	01	00	02	05	00	00	00	10
-.0235					1					1
.0452				1						1
.1940			1							1
.2415			1							1
.2893				1						1
.3000				1						1
.3342						1				1
.5220				1						1
.5430						1				1
.6272			1							1
.6562						1				1
.7768						1				1
.7802								1		1
.8260						1				1
.8442						1				1
.8516						1				1
.8569						1				1
.9574						1				1
1.0131					1					1
1.0557						1				1
1.1212		1								1
1.2283								1		1
1.2394					1					1
MD GROUP		1	03	04	03	10	00	02	00	23
1.2684						1				1
1.5540				1						1
1.5814					1					1
1.7584					1					1
1.9240						1				1
2.0982				1						1
2.7816						1				1
2.9216				1						1
3.1522						1				1
3.1622						1				1
HI GROUP				3	02	05	00	00	00	10
TOTAL	2	01	04	07	07	20	00	02	00	43

¹ See Table 11, p. 41.

Plate 6-1-63: WILLINGNESS TO ACCEPT TECHNOLOGICAL CHANGE VERSUS
YEARLY GROWTH IN UNIT REVENUE.¹

RESPONSE NUMBER										
	0	1	2	3	4	5	6	7	X	T
-.0034					1					1
-.0029					1					1
-.0028					1					1
-.0027						1				1
-.0026						1				1
-.0022						1				1
-.0020					1					1
-.0019						1				1
-.0017						1				1
-.0016						1				1
LO GROUP					4	06	00	00	00	10
-.0016					1					1
-.0016				1						1
-.0015						1				1
-.0015				1						1
-.0014								1		1
-.0014						1				1
-.0012						1				1
-.0011						1				1
-.0009						1				1
-.0009	1									1
-.0009			1							1
-.0008				1						1
-.0008								1		1
-.0005						1				1
-.0004						1				1
-.0004				1						1
-.0004						1				1
-.0003		1								1
-.0003					1					1
-.0002			1							1
-.0002			1							1
-.0001	1									1
.0003						1				1
MD GROUP	2	01	03	04	02	09	00	02	00	23
.0004			1							1
.0006				1						1
.0008						1				1
.0010					1					1
.0011				1						1
.0013						1				1
.0017						1				1
.0018						1				1
.0018				1						1
.0020						1				1
HI GROUP			1	03	01	05	00	00	00	10
TOTAL	2	01	04	07	07	20	00	02	00	43

¹ See Table 12, p. 41.

	RESPONSE NUMBER								
	1	2	3	4	5	6	7	X	T
213470		1							1
221562		1							1
247533	1								1
269451		1							1
316344	1								1
338037		1							1
338883	1								1
343237	1								1
344562		1							1
412395		1							1
LO GROUP	4	06	00	00	0				10
440298	1								1
448055	1								1
448441	1								1
449350		1							1
453825	1								1
457604	1								1
457712	1								1
468293	1								1
471827		1							1
506046		1							1
516020	1								1
517112	1								1
546710	1								1
558675		1							1
639630		1							1
670426		1							1
686670		1							1
686926	1								1
745133	1								1
793517	1								1
859605	1								1
915179	1								1
921065	1								1
MD GROUP	16	07	00	00	0				23
1033295		1							1
1076942	1								1
1109242	1								1
1156916	1								1
1522757	1								1
1769466		1							1
1782610	1								1
1784258		1							1
1818542	1								1
2168118	1								1
HI GROUP	7	03	00	00	0				10
TOTAL	27	16	00	00	0				43

¹ See Table 13, p. 42.

	RESPONSE NUMBER								
	1	2	3	4	5	6	7	X	T
26.2065		1							1
26.5408	1								1
27.3110	1								1
27.6188		1							1
27.8426		1							1
27.8665		1							1
28.6011	1								1
28.6826		1							1
28.7000	1								1
29.0200		1							1
LO GROUP	4	06	00	00	0				10
29.0293		1							1
29.6151		1							1
29.6530	1								1
29.7983		1							1
29.8583	1								1
30.0550	1								1
30.5250	1								1
30.6920	1								1
30.9833	1								1
31.0583	1								1
31.1478	1								1
31.3516		1							1
31.3803	1								1
31.4610	1								1
31.9906	1								1
32.1010	1								1
32.1771		1							1
32.4863		1							1
32.5188	1								1
32.5298		1							1
32.6285		1							1
32.6430	1								1
33.0508	1								1
MD GROUP	15	08	00	00	0				23
33.2246	1								1
33.3110		1							1
34.3301	1								1
34.5116	1								1
35.7545	1								1
37.9466	1								1
38.3236		1							1
38.5878	1								1
38.6073	1								1
40.7445	1								1
HI GROUP	8	02	00	00	0				10
TOTAL									
	27	16	00	00	0				43

¹ See Table 14, p. 43.

Plate 5-1-64: QUALITY PREFERENCE VERSUS ACTUAL GROWTH
PER YEAR IN PLANT SIZE.¹

	RESPONSE NUMBER								
	1	2	3	4	5	6	7	X	T
-1082	1								1
-954	1								1
-897		1							1
-691	1								1
-649	1								1
-492		1							1
-219	1								1
149	1								1
342	1								1
657		1							1
LO GROUP	7	03	00	00	0				10
664	1								1
804		1							1
816	1								1
894	1								1
991		1							1
1061	1								1
1221		1							1
1336		1							1
1451		1							1
1564	1								1
1696		1							1
1721	1								1
1884	1								1
2292	1								1
2572	1								1
3136		1							1
3170	1								1
3318	1								1
3482	1								1
3949	1								1
4243		1							1
5690	1								1
6154	1								1
MD GROUP	15	08	00	00	0				23
6212		1							1
6940		1							1
7018	1								1
9020		1							1
10260	1								1
10301		1							1
11142	1								1
13492	1								1
15046		1							1
17289	1								1
HI GROUP	5	05	00	00	0				10
TOTAL	27	16	00	00	0				43

¹ See Table 15, p. 43.

Plate 2-3-65: CHOICE BETWEEN VOLUME AND QUALITY VERSUS
DOLLAR RETURN PER SQ. FT.¹

RESPONSE NUMBER									
	1	2	3	4	5	6	7	X	T
2.0400		1							1
2.0516		1							1
2.1083		1							1
2.1366		1							1
2.1687		1							1
2.2316	1								1
2.2716		1							1
2.2938		1							1
2.2946		1							1
2.3016		1							1
LO GROUP	1	09	00	00	0				10
2.3212		1							1
2.3966		1							1
2.4926		1							1
2.5029	1								1
2.5466		1							1
2.5505		1							1
2.6359		1							1
2.6377		1							1
2.6801	1								1
2.7006	1								1
2.7361		1							1
2.8108		1							1
2.8686		1							1
2.8823	1								1
2.8846		1							1
2.9116		1							1
2.9340		1							1
2.9847	1								1
2.9989		1							1
3.0093	1								1
3.1301	1								1
3.1470		1							1
3.1612		1							1
MD GROUP	7	16	00	00	0				23
3.1747	1								1
3.1979		1							1
3.2224	1								1
3.2425	1								1
3.2553		1							1
3.3076	1								1
3.4036		1							1
3.4714	1								1
3.5852	1								1
3.9078	1								1
HI GROUP	7	03	00	00	0				10
TOTAL									
	15	28	00	00	0				43

¹ See Table 16, p. 45.

Plate 6-3-65: CHOICE BETWEEN VOLUME AND QUALITY VERSUS
DOLLAR RETURN PER UNIT.¹

RESPONSE NUMBER									
	1	2	3	4	5	6	7	X	T
.0683		1							1
.0705		1							1
.0708		1							1
.0741		1							1
.0742		1							1
.0744		1							1
.0745		1							1
.0751	1								1
.0768		1							1
.0773		1							1
LO GROUP	1	09	00	00	0				10
.0823		1							1
.0828		1							1
.0828		1							1
.0833	1								1
.0839	1								1
.0858	1								1
.0872		1							1
.0873		1							1
.0875		1							1
.0883	1								1
.0884		1							1
.0889		1							1
.0892		1							1
.0901	1								1
.0902		1							1
.0904	1								1
.0934	1								1
.0934		1							1
.0935		1							1
.0942		1							1
.0947		1							1
.0953	1								1
.0956	1								1
MD GROUP	9	14	00	00	0				23
.0960	1								1
.0961	1								1
.0961	1								1
.0962		1							1
.0963		1							1
.0978		1							1
.0981		1							1
.1011	1								1
.1017	1								1
.1042		1							1
HI GROUP	5	05	00	00	0				10
TOTAL	15	28	00	00	0				43

¹ See Table 17, p. 46.

Plate 3-3-65: CHOICE BETWEEN VOLUME AND QUALITY VERSUS
PROCESS INTENSITY.¹

	RESPONSE NUMBER								
	1	2	3	4	5	6	7	X	T
26.2065		1							1
26.5408		1							1
27.3110		1							1
27.6188	1								1
27.8426		1							1
27.8665		1							1
28.6011		1							1
28.6826		1							1
28.7000		1							1
29.0200		1							1
	1	09	00	00	0				10
LO GROUP									
29.0293		1							1
29.6151		1							1
29.6530		1							1
29.7983	1								1
29.8583		1							1
30.0550		1							1
30.5250		1							1
30.6920		1							1
30.9833		1							1
31.0583		1							1
31.1478	1								1
31.3516	1								1
31.3803		1							1
31.4610	1								1
31.9906		1							1
32.1010	1								1
32.1771	1								1
32.4863	1								1
32.5188		1							1
32.5298	1								1
32.6205		1							1
32.6430	1								1
33.0508		1							1
	9	14	0	00	0				23
MD GROUP									
33.2246		1							1
33.3110	1								1
34.3301		1							1
34.5116		1							1
35.7545		1							1
37.9466		1							1
38.3236	1								1
38.5878	1								1
38.6073	1								1
40.7445	1								1
	5	05	00	00	0				10
HI GROUP									
TOTAL									
	15	28	00	00	0				43

¹ See Table 18, p. 46.

Plate 4-1-65: CHOICE BETWEEN PRODUCTION VOLUME AND QUALITY
VERSUS ACTUAL GROWTH IN PLANT SIZE.¹

	RESPONSE NUMBER								
	1	2	3	4	5	6	7	X	T
-2161		1							1
-386		1							1
-170	1								1
-141	1								1
-60		1							1
-35	1								1
-33		1							1
-14	1								1
-13		1							1
-		1							1
LO GROUP	4	06	00	00	0				10
-		1							1
		1							1
18		1							1
28		1							1
36	1								1
40		1							1
100	1								1
130		1							1
170	1								1
187		1							1
332		1							1
355		1							1
461	1								1
521	1								1
523		1							1
536	1								1
566		1							1
631		1							1
636		1							1
677	1								1
761		1							1
795		1							1
1216		1							1
MD GROUP	7	16	00	00	0				23
1267		1							1
1609	1								1
1925		1							1
3040	1								1
3127		1							1
3168		1							1
3381	1								1
4621	1								1
4784		1							1
5875		1							1
HI GROUP	4	06	00	00	0				10
TOTAL	15	28	00	00	0				43

¹ See Table 19, p. 47.

Plate 5-3-65: CHOICE BETWEEN PRODUCTION VOLUME AND QUALITY
VERSUS TOTAL DOLLAR REVENUE.¹

RESPONSE NUMBER									
	1	2	3	4	5	6	7	X	T
17534		1							1
20818		1							1
23466		1							1
24571		1							1
28206		1							1
30450		1							1
32096		1							1
32234	1								1
32319	1								1
33857		1							1
LO GROUP	2	08	00	00	0				10
36727		1							1
37737	1								1
38898	1								1
39004	1								1
39223		1							1
40524		1							1
40851		1							1
42478	1								1
42748	1								1
43389		1							1
48411		1							1
51836	1								1
52343	1								1
53622	1								1
53750		1							1
55587		1							1
57499		1							1
58948		1							1
61435	1								1
69993	1								1
75697		1							1
81569		1							1
86051	1								1
MD GROUP	11	12	00	00	0				23
87510	1								1
90034		1							1
96540	1								1
100020		1							1
103186		1							1
122786		1							1
127552		1							1
132257		1							1
147670		1							1
209166		1							1
HI GROUP	2	08	00	00	0				10
TOTAL	15	28	00	00	0				43

¹ See Table 20, p. 48.

Plate 2-3-67: ATTITUDE TOWARD USEFULNESS OF PRODUCTION COST
DATA VERSUS DOLLAR RETURN PER SQUARE FOOT.¹

	RESPONSE NUMBER								
	1	2	3	4	5	6	7	X	T
2.0400	1								1
2.0516	1								1
2.1083	1								1
2.1366	1								1
2.1687			1						1
2.2316	1								1
2.2716	1								1
2.2938			1						1
2.2946			1						1
2.3016	1								1
LO GROUP	7	00	03	00	00	00			10
2.3212	1								1
2.3966			1						1
2.4926	1								1
2.5029	1								1
2.5466	1								1
2.5505		1							1
2.6359	1								1
2.6377			1						1
2.6801	1								1
2.7006	1								1
2.7361	1								1
2.8108		1							1
2.8686	1								1
2.8823			1						1
2.8846	1								1
2.9116		1							1
2.9340	1								1
2.9847		1							1
2.9989			1						1
3.0093		1							1
3.1301	1								1
3.1470	1								1
3.1612		1							1
MD GROUP	13	06	04	00	00	00			23
3.1747		1							1
3.1979	1								1
3.2224		1							1
3.2425			1						1
3.2553		1							1
3.3076	1								1
3.4036		1							1
3.4714	1								1
3.5852		1							1
3.9078		1							1
HI GROUP	3	06	01	00	00	00			10
TOTAL	23	12	08	00	00	00			43

¹ See Table 21, p. 50.

Plate 6-3-67: ATTITUDE TOWARD USEFULNESS OF PRODUCTION COST
DATA VERSUS DOLLAR RETURN PER UNIT.¹

		RESPONSE NUMBER								
		1	2	3	4	5	6	7	X	T
.0683		1								1
.0705		1								1
.0708		1								1
.0741		1								1
.0742		1								1
.0744		1								1
.0745		1								1
.0751		1								1
.0768			1							1
.0773				1						1
LO GROUP		8	01	01	00	00				10
.0823				1						1
.0828				1						1
.0828				1						1
.0833		1								1
.0839			1							1
.0858		1								1
.0872		1								1
.0873		1								1
.0875				1						1
.0883				1						1
.0884		1								1
.0889				1						1
.0892			1							1
.0901		1								1
.0902		1								1
.0904		1								1
.0934			1							1
.0934		1								1
.0935		1								1
.0942		1								1
.0947			1							1
.0953			1							1
.0956			1							1
MD GROUP		11	06	06	00	00				23
.0960			1							1
.0961		1								1
.0961			1							1
.0962		1								1
.0963		1								1
.0978			1							1
.0981			1							1
.1011				1						1
.1017		1								1
.1042			1							1
HI GROUP		4	05	01	00	00				10
TOTAL		23	12	08	00	00	00			43

¹ See Table 22, p. 50.

Plate 1-3-70: DISTRIBUTION OF RESPONSE TO "MOST SERIOUS
INDUSTRY PROBLEM" QUESTION.¹

	RESPONSE NUMBER								
	1	2	3	4	5	6	7	X	T
213470	1								1
221562					1				1
247533				1					1
269451					1				1
316344					1				1
338037	1								1
338883	1								1
343237	1								1
344562		1							1
412395					1				1
LO GROUP	4	01	00	01	04	00	00	00	10
440298					1				1
448055					1				1
448441	1								1
449350					1				1
453825					1				1
457604		1							1
457712				1					1
468293					1				1
471827					1				1
506046					1				1
516020					1				1
517112					1				1
546710					1				1
558675					1				1
639630	1								1
670426			1						1
686670					1				1
686926					1				1
745133					1				1
793517					1				1
859605	1								1
915179					1				1
921065					1				1
MD GROUP	3	01	01	01	17	00	00	00	23
1033295	1								1
1076942					1				1
1109242	1								1
1156916	1								1
1522757	1								1
1769466					1				1
1782610					1				1
1784258					1				1
1818542					1				1
2168118	1								1
HI GROUP	5	00	00	00	05	00	00	00	10
TOTAL	12	02	01	02	26	00	00	00	43

¹ See Table 23, p. 52.

Plate 1-3-71: LONG-RANGE PLANNING FOR GROWTH VERSUS SIZE
IN TERMS OF PRODUCTION VOLUME.¹

	RESPONSE NUMBER								
	1	2	3	4	5	6	7	X	T
213470		1							1
221562	1								1
247533	1								1
269451	1								1
316344	1								1
338037		1							1
338883		1							1
343237		1							1
344562		1							1
412395	1								1
LO GROUP	5	05	00	00	0				10
440298	1								1
448055	1								1
448441	1								1
449350	1								1
453825	1								1
457604	1								1
457712		1							1
468293		1							1
471827	1								1
506046	1								1
516020	1								1
517112	1								1
546710	1								1
558675	1								1
639630	1								1
670426	1								1
686670	1								1
686926	1								1
745133		1							1
793517		1							1
859605	1								1
915179	1								1
921065	1								1
MD GROUP	19	04	00	00	0				23
1033295	1								1
1076942	1								1
1109242	1								1
1156916		1							1
1522757	1								1
1769466	1								1
1782610	1								1
1784258			1						1
1818542	1								1
2168118	1								1
HI GROUP	8	01	01	00	00	00			10
TOTAL	32	10	01	00	00	00			43

¹ See Table 24, p. 53.

Plate 6-3-71: LONG-RANGE PLANNING FOR GROWTH VERSUS
DOLLAR RETURN PER UNIT.¹

	RESPONSE NUMBER								
	1	2	3	4	5	6	7	X	T
.0683	1								1
.0705	1								1
.0708	1								1
.0741	1								1
.0742		1							1
.0744		1							1
.0745	1								1
.0751	1								1
.0768	1								1
.0773		1							1
LO GROUP	7	03	00	00	0				10
.0823		1							1
.0828	1								1
.0828			1						1
.0833	1								1
.0839		1							1
.0858	1								1
.0872	1								1
.0873	1								1
.0875		1							1
.0883	1								1
.0884	1								1
.0889	1								1
.0892	1								1
.0901	1								1
.0902	1								1
.0904	1								1
.0934		1							1
.0934	1								1
.0935		1							1
.0942	1								1
.0947		1							1
.0953		1							1
.0956	1								1
MD GROUP	15	07	01	00	00	+			23
.0960	1								1
.0961	1								1
.0961	1								1
.0962	1								1
.0963	1								1
.0978	1								1
.0981	1								1
.1011	1								1
.1017	1								1
.1042	1								1
HI GROUP	10	00	00	00					10
TOTAL	32	10	01	00	00	-0			43

¹ See Table 25, p. 54.

Plate 3-3-71: LONG-RANGE PLANNING FOR GROWTH VERSUS
PROCESS INTENSITY.¹

	RESPONSE NUMBER								
	1	2	3	4	5	6	7	X	T
26.2065			1						1
26.5408	1								1
27.3110	1								1
27.6188	1								1
27.8426		1							1
27.8665	1								1
28.6011	1								1
28.6826	1								1
28.7000	1								1
29.0200	1								1
LO GROUP	8	01	01	00	00	00			10
29.0293	1								1
29.6151	1								1
29.6530		1							1
29.7983	1								1
29.8583	1								1
30.0550	1								1
30.5250	1								1
30.6920		1							1
30.9833		1							1
31.0583		1							1
31.1478	1								1
31.3516	1								1
31.3803	1								1
31.4610	1								1
31.9906	1								1
32.1010	1								1
32.1771	1								1
32.4863	1								1
32.5188	1								1
32.5298	1								1
32.6285	1								1
32.6430	1								1
33.0508	1								1
MD GROUP	19	04	00	00	0				23
33.2246	1								1
33.3110		1							1
34.3301		1							1
34.5116		1							1
35.7545	1								1
37.9466	1								1
38.3236		1							1
38.5878	1								1
38.6073		1							1
40.7445	1								1
HI GROUP	5	05	00	00	0				10
TOTAL	32	10	01	00	00	00			43

¹ See Table 26, p. 54.

Plate 1-3-72: ATTITUDE TOWARD INDUSTRY INSTITUTIONAL
ADVERTISING EXPENDITURES VERSUS SIZE IN
TERMS OF PRODUCTION VOLUME.¹

		RESPONSE NUMBER								
		1	2	3	4	5	6	7	X	T
		1								1
213470		1								1
221562			1							1
247533		1								1
269451			1							1
316344		1								1
338037		1								1
338883		1								1
343237			1							1
344562		1								1
412395		1								1
		7	03	00	00	0				10
LO GROUP										
		1								1
440298		1								1
448055		1								1
448441		1								1
449350		1								1
453825		1								1
457604		1								1
457712		1								1
468293									1	1
471827		1								1
506046			1							1
516020		1								1
517112		1								1
546710		1								1
558675		1								1
639630		1								1
670426		1								1
686670		1								1
686926			1							1
745133			1							1
793517		1								1
859605		1								1
915179		1								1
921065		1								1
		19	03	00	00	0			1	23
MD GROUP										
		1								1
1033295		1								1
1076942		1								1
1109242		1								1
1156916		1								1
1522757		1								1
1769466		1								1
1782610		1								1
1784258		1								1
1818542		1								1
2168118		1								1
		10	00	00	00					10
HI GROUP										
		36	06	00	00	0			1	43
TOTAL										

¹ See Table 27, p. 55.

RESPONSE NUMBER									
	1	2	3	4	5	6	7	X	T
-.0840		1							1
-.0108	1								1
-.0042		1							1
-.0025	1								1
-.0020		1							1
-.0010		1							1
-.0006	1								1
-.0005		1							1
-.0004		1							1
-.0001		1							1
LO GROUP	3	07	00	00	0				10
0.0000		1							1
0.0000		1							1
0.0000		1							1
.0002		1							1
.0008		1							1
.0008		1							1
.0009		1							1
.0033		1							1
.0041		1							1
.0044		1							1
.0048		1							1
.0084		1							1
.0107	1								1
.0121		1							1
.0123		1							1
.0132		1							1
.0144		1							1
.0153	1								1
.0159		1							1
.0172		1							1
.0188		1							1
.0296		1							1
.0338		1							1
MD GROUP	2	21	00	00	0				23
.0373		1							1
.0403		1							1
.0441		1							1
.0520		1							1
.0615		1							1
.0737		1							1
.0794		1							1
.0883		1							1
.0963		1							1
.2009		1							1
HI GROUP		10	00	00	0				10
	5	38	00	00	0				43

¹ See Table 28, p. 57.

Plate 6-4-73: ATTITUDE TOWARD DIVERSIFICATION OF PRODUCT VERSUS
RELATIVE YEARLY GROWTH IN DOLLAR RETURN PER UNIT.¹

RESPONSE NUMBER									
	1	2	3	4	5	6	7	X	T
-.0197		1							1
-.0178		1							1
-.0164		1							1
-.0157		1							1
-.0157		1							1
-.0147		1							1
-.0127		1							1
-.0115		1							1
-.0111		1							1
-.0097		1							1
		10	00	00	0				10
LO GROUP									
-.0095		1							1
-.0093		1							1
-.0089		1							1
-.0085		1							1
-.0084		1							1
-.0067	1								1
-.0066		1							1
-.0059		1							1
-.0049		1							1
-.0048	1								1
-.0047		1							1
-.0044		1							1
-.0042		1							1
-.0032		1							1
-.0025		1							1
-.0024		1							1
-.0024		1							1
-.0022		1							1
-.0020		1							1
-.0012		1							1
-.0012		1							1
-.0008		1							1
.0010		1							1
	2	21	0	00	0				23
MD GROUP									
.0021		1							1
.0026	1								1
.0042		1							1
.0050		1							1
.0053		1							1
.0057		1							1
.0078		1							1
.0085		1							1
.0088	1								1
.0101	1								1
	3	07	00	00	0				10
HI GROUP									
TOTAL									
	5	38	00	00	0				43

¹ See Table 29, p. 57.

Plate 1-3-74: GROSS TABULATION OF RANKING GIVEN THE VARIOUS PERFORMANCE CRITERIA BY RESPONDENTS.¹

RESPONSE NUMBER									
	1	2	3	4	5	6	7	X	T
213470					1				1
221562								1	1
247533			1						1
269451		1							1
316344				1					1
338037				1					1
338883			1						1
343237			1						1
344562		1							1
412395		1							1
LO GROUP		3	03	02	01	00	00	01	10
440298				1					1
448055				1					1
448441		1							1
449350				1					1
453825			1						1
457604		1							1
457712	1								1
468293				1					1
471827				1					1
506046			1						1
516020		1							1
517112	1								1
546710					1				1
558675					1				1
639630		1							1
670426					1				1
686670	1								1
686926			1						1
745133		1							1
793517			1						1
859605			1						1
915179		1							1
921065					1				1
MD GROUP	3	06	05	05	04	00	00	00	23
1033295				1					1
1076942					1				1
1109242			1						1
1156916								1	1
1522757		1							1
1769466			1						1
1782610					1				1
1784258		1							1
1818542				1					1
2168118								1	1
HI GROUP		2	02	02	02	00	00	02	10
TOTAL	3	11	10	09	07	00	00	03	43

¹ See Table 30, p. 59.

Plate 1-3-75: GROSS TABULATION OF RANKING GIVEN THE VARIOUS
PERFORMANCE CRITERIA BY RESPONDENTS.¹
(continued)

RESPONSE NUMBER									
	1	2	3	4	5	6	7	X	T
213470			1						1
221562								1	1
247533				1					1
269451	1								1
316344		1							1
338037						1			1
338883		1							1
343237		1							1
344562	1								1
412395			1						1
LO GROUP	2	03	02	01	00	01	00	01	10
440298					1				1
448055					1				1
448441			1						1
449350					1				1
453825		1							1
457604	1								1
457712		1							1
468293	1								1
471827		1							1
506046		1							1
516020	1								1
517112			1						1
546710				1					1
558675				1					1
639630			1						1
670426	1								1
686670					1				1
686926					1				1
745133			1						1
793517				1					1
859605					1				1
915179			1						1
921065			1						1
MD GROUP	4	04	06	03	06	00	00	00	23
1033295					1				1
1076942	1								1
1109242				1					1
1156916								1	1
1522757	1								1
1769466					1				1
1782610						1			1
1784258	1								1
1818542	1								1
2168118								1	1
HI GROUP	4	00	00	01	02	01	00	02	10
TOTAL	10	07	08	05	08	02	00	03	43

¹ See Table 30, p. 59.

Plate 1-3-76: GROSS TABULATION OF RANKING GIVEN THE VARIOUS
PERFORMANCE CRITERIA BY RESPONDENTS.¹
(continued)

RESPONSE NUMBER									
	1	2	3	4	5	6	7	X	T
213470	1								1
221562								1	1
247533		1							1
269451							1		1
316344					1				1
338037			1						1
338883	1								1
343237				1					1
344562			1						1
412395	1								1
LO GROUP	3	01	02	01	01	00	01	01	10
440298			1						1
448055			1						1
448441				1					1
449350		1							1
453825				1					1
457604			1						1
457712				1					1
468293			1						1
471827			1						1
506046	1								1
516020				1					1
517112		1							1
546710		1							1
558675			1						1
639630	1								1
670426		1							1
686670			1						1
686926				1					1
745133				1					1
793517		1							1
859605				1					1
915179				1					1
921065						1			1
MD GROUP	2	05	07	08	00	01	00	00	23
1033295		1							1
1076942				1					1
1109242		1							1
1156916	1								1
1522757			1						1
1769466				1					1
1782610				1					1
1784258			1						1
1818542			1						1
2168118								1	1
HI GROUP	1	02	03	03	00	00	00	01	10
TOTAL	6	08	12	12	01	01	01	02	43

¹ See Table 30, p. 59.

Plate 1-3-77: GROSS TABULATION OF RANKING GIVEN THE VARIOUS
PERFORMANCE CRITERIA BY RESPONDENTS.¹
(continued)

RESPONSE NUMBER									
	1	2	3	4	5	6	7	X	T
213470							1		1
221562							1		1
247533					1				1
269451			1						1
316344						1			1
338037					1				1
338883						1			1
343237					1				1
344562				1					1
412395				1					1
LO GROUP									
			1	02	03	02	02	00	10
440298						1			1
448055						1			1
448441							1		1
449350						1			1
453825							1		1
457604							1		1
457712					1				1
468293		1							1
471827	1								1
506046					1				1
516020					1				1
517112						1			1
546710						1			1
558675		1							1
639630						1			1
670426				1					1
686670				1					1
686926						1			1
745133					1				1
793517							1		1
859605						1			1
915179							1		1
921065				1					1
MD GROUP									
	1	02	00	03	04	08	05	00	23
1033295						1			1
1076942			1						1
1109242					1				1
1156916								1	1
1522757							1		1
1769466		1							1
1782610							1		1
1784258				1					1
1818542					1				1
2168118								1	1
HI GROUP									
		1	01	01	02	01	02	02	10
TOTAL									
	1	03	02	06	09	11	09	02	43

¹ See Table 30, p. 59.

Plate 1-3-78: GROSS TABULATION OF RANKING GIVEN THE VARIOUS
PERFORMANCE CRITERIA BY RESPONDENTS.¹

(continued)

	RESPONSE NUMBER								
	1	2	3	4	5	6	7	X	T
213470		1							1
221562								1	1
247533	1								1
269451						1			1
316344	1								1
338037	1								1
338883				1					1
343237	1								1
344562					1				1
412395					1				1
LO GROUP	4	01	00	01	02	01	00	01	10
440298	1								1
448055	1								1
448441					1				1
449350	1								1
453825	1								1
457604						1			1
457712			1						1
468293					1				1
471827					1				1
506046				1					1
516020			1						1
517112				1					1
546710	1								1
558675	1								1
639630				1					1
670426			1						1
686670		1							1
686926	1								1
745133	1								1
793517	1								1
859605	1								1
915179	1								1
921065	1								1
MD GROUP	12	01	03	03	03	01	00	00	23
1033295	1								1
1076942		1							1
1109242	1								1
1156916								1	1
1522757				1					1
1769466	1								1
1782610	1								1
1784258						1			1
1818542		1							1
2168118								1	1
HI GROUP	4	02	00	01	00	01	00	02	10
TOTAL	20	04	03	05	05	03	00	03	43

¹ See Table 30, p. 59.

Plate 1-3-79: GROSS TABULATION OF RANKING GIVEN THE VARIOUS
PERFORMANCE CRITERIA BY RESPONDENTS.¹
(continued)

	RESPONSE NUMBER								
	1	2	3	4	5	6	7	X	T
213470						1			1
221562								1	1
247533						1			1
269451					1				1
316344							1		1
338037							1		1
338883							1		1
343237							1		1
344562							1		1
412395						1			1
LO GROUP					1	03	05	01	10
440298							1		1
448055							1		1
448441						1			1
449350							1		1
453825						1			1
457604				1					1
457712							1		1
468293						1			1
471827						1			1
506046							1		1
516020							1		1
517112							1		1
546710							1		1
558675							1		1
639630							1		1
670426							1		1
686670							1		1
686926							1		1
745133						1			1
793517						1			1
859605							1		1
915179						1			1
921065		1							1
MD GROUP	1		00	01	00	07	14	00	23
1033295							1		1
1076942							1		1
1109242						1			1
1156916								1	1
1522757					1				1
1769466							1		1
1782610			1						1
1784258					1				1
1818542							1		1
2168118								1	1
HI GROUP			1	00	02	01	04	02	10
TOTAL									
	1		01	01	03	11	23	03	43

¹ See Table 30, p. 59.

Plate 1-3-80: GROSS TABULATION OF RANKING GIVEN THE VARIOUS
PERFORMANCE CRITERIA BY RESPONDENTS.¹
(continued)

	RESPONSE NUMBER								
	1	2	3	4	5	6	7	X	T
213470				1					1
221562								1	1
247533						1			1
269451				1					1
316344			1						1
338037		1							1
338883					1				1
343237						1			1
344562						1			1
412395							1		1
		1	01	02	01	03	01	01	10
LO GROUP									
440298		1							1
448055		1							1
448441	1								1
449350			1						1
453825					1				1
457604					1				1
457712						1			1
468293							1		1
471827							1		1
506046						1			1
516020						1			1
517112					1				1
546710			1						1
558675						1			1
639630					1				1
670426						1			1
686670						1			1
686926		1							1
745133						1			1
793517					1				1
859605		1							1
915179					1				1
921065							1		1
	1	04	02	00	06	07	03	00	23
MD GROUP									
1033295			1						1
1076942						1			1
1109242							1		1
1156916								1	1
1522757					1				1
1769466						1			1
1782610		1							1
1784258					1				1
1818542						1			1
2168118								1	1
		1	01	00	02	03	01	02	10
HI GROUP									
TOTAL	1	06	04	02	09	13	05	03	43

¹ See Table 30, p. 59.

Plate 6-3-74: ANALYSIS OF RETURN PER UNIT AS EX ANTE
PERFORMANCE CRITERION VERSUS EX POST
REALIZATION OF RETURN PER UNIT.¹

RESPONSE NUMBER									
	1	2	3	4	5	6	7	X	T
.0683		1							1
.0705			1						1
.0708				1					1
.0741		1							1
.0742			1						1
.0744			1						1
.0745					1				1
.0751			1						1
.0768					1				1
.0773		1							1
LO GROUP		3	04	01	02	00	00	00	10
.0823					1				1
.0828					1				1
.0828		1							1
.0833				1					1
.0839								1	1
.0858				1					1
.0872		1							1
.0873		1							1
.0875				1					1
.0883				1					1
.0884			1						1
.0889		1							1
.0892			1						1
.0901			1						1
.0902			1						1
.0904				1					1
.0934		1							1
.0934		1							1
.0935			1						1
.0942								1	1
.0947	1								1
.0953				1					1
.0956					1				1
MD GROUP	1	06	05	06	03	00	00	02	23
.0960					1				1
.0961				1					1
.0961					1				1
.0962				1					1
.0963								1	1
.0976			1						1
.0981		1							1
.1011	1								1
.1017	1								1
.1042		1							1
HI GROUP	2	02	01	02	02	00	00	01	10
TOTAL	3	11	10	09	07	00	00	03	43

¹ See Table 31, p. 60.

Plate 6-3-75: ANALYSIS OF QUALITY AS EX ANTE PERFORMANCE
CRITERION VERSUS EX POST REALIZATION OF
QUALITY PERFORMANCE.¹

	RESPONSE NUMBER								
	1	2	3	4	5	6	7	X	T
.0683	1								1
.0705					1				1
.0708	1								1
.0741	1								1
.0742				1					1
.0744		1							1
.0745						1			1
.0751		1							1
.0768	1								1
.0773			1						1
LO GROUP	4	02	01	01	01	01	00	00	10
.0823			1						1
.0828	1								1
.0828	1								1
.0833					1				1
.0839								1	1
.0858					1				1
.0872			1						1
.0873			1						1
.0875	1								1
.0883					1				1
.0884					1				1
.0889			1						1
.0892		1							1
.0901					1				1
.0902				1					1
.0904		1							1
.0934	1								1
.0934	1								1
.0935		1							1
.0942								1	1
.0947		1							1
.0953						1			1
.0956				1					1
MD GROUP	5	04	04	02	05	01	00	02	23
.0960			1						1
.0961					1				1
.0961				1					1
.0962		1							1
.0963								1	1
.0978				1					1
.0981			1						1
.1011			1						1
.1017					1				1
.1042	1								1
HI GROUP	1	01	03	02	02	00	00	01	10
TOTAL									
	10	07	08	05	08	02	00	03	43

¹ See Table 32, p. 60.

Plate 2-3-76: ANALYSIS OF RETURN PER SQUARE FOOT AS EX ANTE
PERFORMANCE CRITERION VERSUS EX POST
REALIZATION OF RETURN PER SQUARE FOOT.¹

	RESPONSE NUMBER								
	1	2	3	4	5	6	7	X	T
2.0400				1					1
2.0516			1						1
2.1083			1						1
2.1366				1					1
2.1687			1						1
2.2316	1								1
2.2716			1						1
2.2938		1							1
2.2946	1								1
2.3016		1							1
LO GROUP	2	02	04	02	00	00	00	0	10
2.3212				1					1
2.3966				1					1
2.4926	1								1
2.5029			1						1
2.5466	1								1
2.5505				1					1
2.6359								1	1
2.6377	1								1
2.6801		1							1
2.7006			1						1
2.7361								1	1
2.8108				1					1
2.8686				1					1
2.8823			1						1
2.8846		1							1
2.9116				1					1
2.9340				1					1
2.9847		1							1
2.9989			1						1
3.0093			1						1
3.1301		1							1
3.1470				1					1
3.1612		1							1
MD GROUP	3	05	05	08	00	00	00	02	23
3.1747			1						1
3.1979					1				1
3.2224	1								1
3.2425		1							1
3.2553				1					1
3.3076			1						1
3.4036							1		1
3.4714				1					1
3.5852			1						1
3.9078						1			1
HI GROUP	1	01	03	02	01	01	01	00	10
TOTAL	6	08	12	12	01	01	01	02	43

¹ See Table 33, p. 62.

Plate 6-1-78: ANALYSIS OF NET PROFIT AS EX ANTE PERFORMANCE
CRITERION VERSUS EX POST REALIZATION OF YEARLY
GROWTH IN DOLLAR RETURN PER UNIT.¹

	RESPONSE NUMBER								
	1	2	3	4	5	6	7	X	T
-.0034	1								1
-.0029				1					1
-.0028				1					1
-.0027						1			1
-.0026		1							1
-.0022	1								1
-.0020	1								1
-.0019	1								1
-.0017	1								1
-.0016		1							1
LO GROUP	5	02	00	02	00	01	00	00	10
-.0016		1							1
-.0016			1						1
-.0015								1	1
-.0015	1								1
-.0014				1					1
-.0014			1						1
-.0012					1				1
-.0011					1				1
-.0009	1								1
-.0009								1	1
-.0009	1								1
-.0008					1				1
-.0008	1								1
-.0005	1								1
-.0004	1								1
-.0004	1								1
-.0004					1				1
-.0003	1								1
-.0003	1								1
-.0002	1								1
-.0002	1								1
-.0001	1								1
.0003	1								1
MD GROUP	13	01	02	01	04	00	00	02	23
.0004								1	1
.0006				1					1
.0008	1								1
.0010						1			1
.0011			1						1
.0013						1			1
.0017					1				1
.0018				1					1
.0018	1								1
.0020		1							1
HI GROUP	2	01	01	02	01	02	00	01	10
TOTAL	20	04	03	05	05	03	00	03	43

¹ See Table 34, p. 63.

Date Due

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